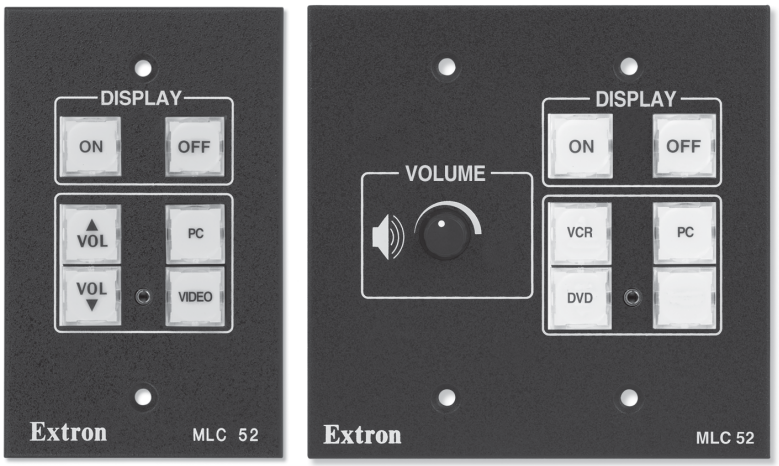
Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



MLC 52 Series

MediaLink™ Controllers

68-1079-01 **Rev. D**
04 07

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全 和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追 加设备，以避免危险。

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须 使用有地线的供电系统供电。
第三条线（地线）是 安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设 备后或桌面电源的电源线，
或任何接到市电系统的 电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内 部没有用户可以更换的零件。
为避免出现触电危险 不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来 防止机内敏感元件过热。
不要用任何东西挡住通 风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用 与厂家推荐的相同或相近型号的电池。
按照生产厂 的建议处理废弃电池。

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Chapter One

Introduction

About the MLC 52 Series

Features and Options

MLC 52 Application Examples

Introduction

About the MLC 52 Series

The Extron MediaLink™ Controller 52 (MLC 52) Series provide RS-232 and/or infrared (IR) remote control of a projector or other display device. They are economical, compact (one-gang or two-gang size), easy-to-use controllers for use with audiovisual equipment in sites such as elementary or high school classrooms, or small conference rooms. The MLC 52 acts as a universal remote control panel, providing control for a display device's power, input selection, volume, and more. The MLC 52 can be configured using three different methods:

- Infrared (IR) learning
- IR data transfer ("beaming") from another MLC 52
- Using Extron device control drivers with the Windows®-based configuration software program

Features and Options

The MLC 52 is available in the following models:

MLC 52 IR — 1-gang size; controls the display device by IR.

MLC 52 RS — 1-gang size; controls the display device by either IR or RS-232.

MLC 52 IR VC — 2-gang size; controls the display device via IR. This model has a volume control knob to control an amplifier such as the Extron MPA Mini Power Amplifier (purchased separately).

MLC 52 RS VC — 2-gang size; controls the display device by either IR or RS-232. This model has a volume control knob to control an amplifier such as the Extron MPA Mini Power Amplifier (purchased separately).

NOTE *The terms "MLC," "MLC 52," and "controller" are used interchangeably in this manual to refer to all four models of the MediaLink controller unit, regardless of which faceplate is attached to it. The cabling, operation, and setup are identical for all models; the models differ only in how they are controlled.*

Standard features

IR and RS-232 ports for universal display device control — The MLC 52 has a dedicated port for communicating with virtually any projector or display via infrared (IR) signal. The MLC 52 RS models also have ports for unidirectional RS-232 wired serial control. Projector control drivers can be downloaded from the Extron Web site or created using the Windows-based configuration program.

Discrete On and Off display device power controls — These controls simplify system operations and eliminate the need for a device's handheld remote control.

Configurable, backlit buttons — The configurable buttons can be set up to control display device power, volume, input selection, or any other IR or RS-232 command function supported by the device. The buttons are backlit and can be custom labeled, offering easy operation for presenters in low-light environments.

Macro and toggle button modes — Each button on the MLC can be programmed to send out up to four IR or serial commands. You can set each button either to issue all its commands with one press (macro mode) or to issue one of its commands at a time, in sequence, with each button press (toggle mode).

Front panel configuration port — This RS-232 serial port enables advanced configuration, driver downloads, and firmware updates to be performed from the front panel without the need to remove the controller from its mounting. The optional Extron configuration cable (part #70-335-01) can be used to connect the MLC 52 to the PC's RS-232 port.

Three configuration methods — The MLC 52 can be configured easily using the following methods:

- **IR learning** — Allows the MLC 52 to be set up directly from the display device's remote control without the need for software.
- **IR data transfer** — Duplicates complete configuration information from one MLC 52 model to another without cables or software.
- **Windows-based configuration software** — Combined with one of the many IR or RS-232 drivers that are provided with the controller on CD or available on the Extron Web site, Extron's MLC 52 Configuration Program software provides fast and simple setup.

Inactivity timer for display shutoff — Adjustable timer control provides automatic shutdown of the display device to conserve energy, prevent plasma burn-in, and extend projector lamp life.

Front panel security lockout — Front panel lockout (executive mode) can be implemented if the MLC 52 is installed in an unsecured environment where universal access is not desirable.

High-impact mounting faceplates — The standard MLC 52 models are provided with two one-gang sized high-impact plastic faceplates (one black and one white), that are durable enough for demanding environments.

The MLC 52 VC models include two two-gang sized high impact plastic faceplates (one black and one white).

Flexible mounting options — With a standard electrical box or one of the included mounting brackets ("mud rings"), the MLC 52 can be mounted in a wide variety of locations, including walls, lecterns, and tables.

Volume control (VC) faceplate — The two-gang sized MLC 52 IR VC and the MLC 52 RS VC each have a volume control knob in addition to the six control buttons. To use this knob, you must connect the MLC 52 to a power amplifier (purchased separately), such as the Extron MPA Series Mini Power Amplifier, to which you also connect the projector or display (see the application diagram on page 1-4). The volume control knob adjusts the volume on the amplifier. This option frees up the two volume control buttons on the MLC to be used or reconfigured for other display device functions.

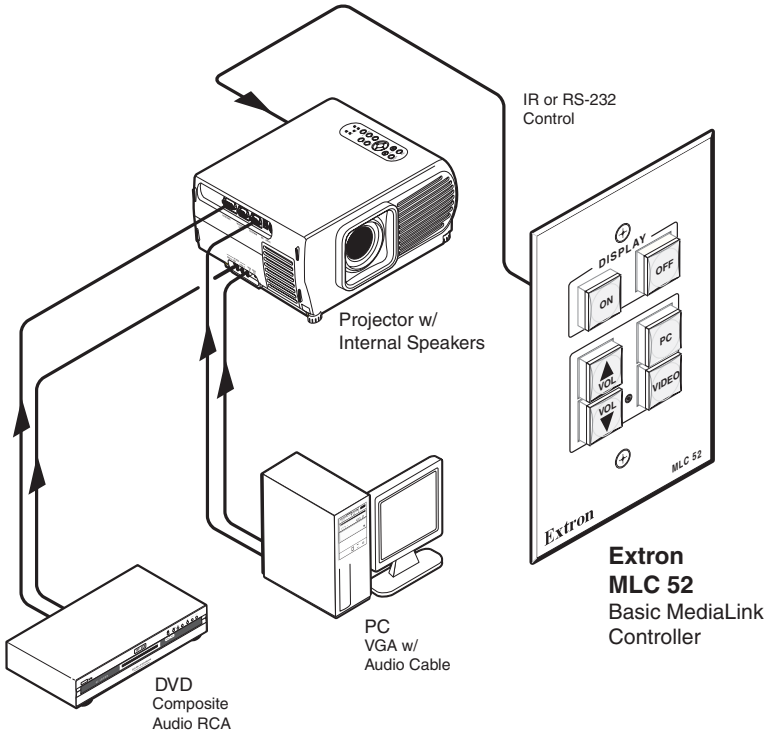
Options and accessories

MPA Series Mini Power Amplifier — Connect an MPA 122 (part #60-668-01) or an MPA 181T (part #60-747-01) to the volume control port of the MLC 52 VC models, and to your projector or display and speakers. This enables you to use the MLC's volume knob to control the volume of the speakers via the MPA.

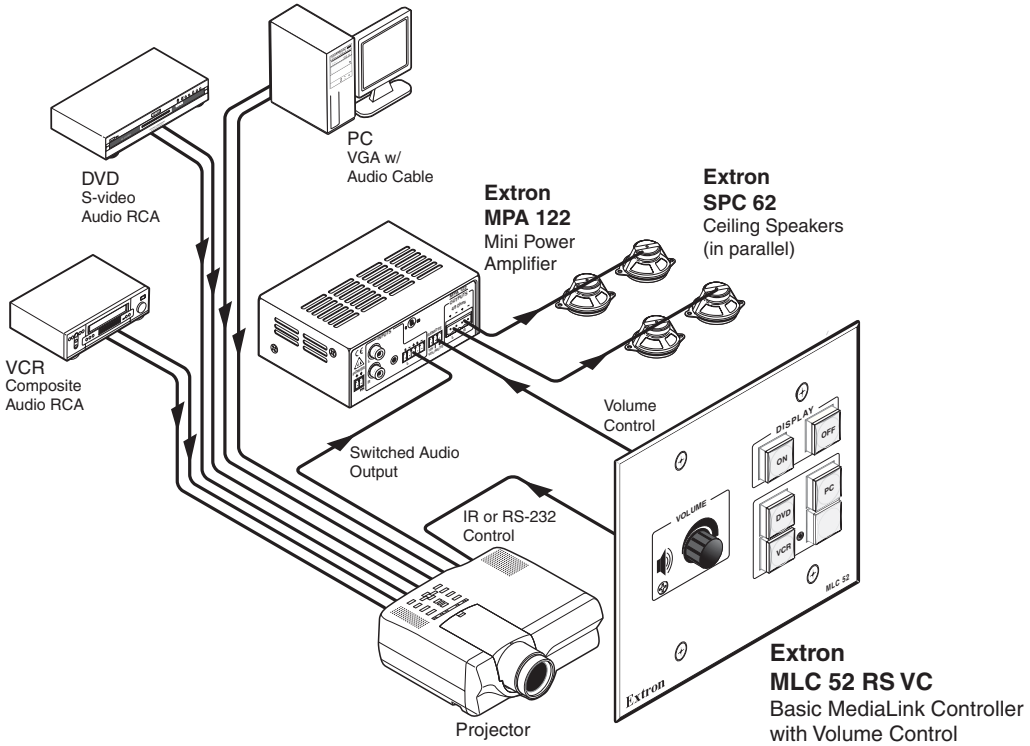
Remote control — The optional IR 452 Remote Control and optional IR signal repeater provide infrared remote control of the MLC unit from up to 30 feet away.

NOTE *The Extron P/S 100 and other Extron power supplies may be used with the MLC 52.*

MLC 52 Application Examples



Application diagram for a standard MLC 52 (1-gang size)



Chapter Two

Installation

Installation Overview

UL Requirements

Installation Procedures

Installation

Installation Overview

CAUTION *Installation and service must be performed by authorized personnel only. UL listed electrical boxes are recommended. See "UL Requirements," on the next page.*

To install and set up the MLC, follow these steps:

1. If applicable, prepare the installation site: cut a hole in the wall, install the electrical box or mounting bracket ("mud ring"), and prepare the cables. Instructions are included in this manual and/or with the optional faceplate, mounting device, or wall box.

   NOTE *Metal versions of the one-gang and VC faceplates are available as options.*

   See "Preparing the site and installing the wall box," later in this chapter.

2. Make and/or install button labels as desired. See "Replacing button labels," later in this chapter.

3. If you want to use a different faceplate from the one that is attached, remove the installed faceplate from the MLC, and replace it with the new one. See "Replacing the faceplate," later in this chapter.

4. Attach cables to the rear of the MLC and to the display device; MPA Mini Power Amplifier (if applicable); and optional IR Link, IR Emitters, and/or IRL 20.

5. Connect power cords and turn on all the devices, including the MLC.

6. Configure the controller by using one of the following methods:
   - IR learning (See "Configuring using IR learning," in chapter 3, "Operations.")
   - IR data transfer (cloning) (See "Configuring using data transfer," in chapter 3, "Operations.")
   - Windows®-based configuration software program (See "Using the MLC 52Configuration Program" in chapter 5, "Serial Communication," for detailed information on the configuration software.)

7. Test the system: press the MLC's buttons, watch the display, and listen to the audio output to determine whether the output devices are responding correctly (powering on/off, switching inputs, etc.). If not, ensure that all devices are plugged in and receiving power. Check the cabling, and make adjustments as needed.

8. Mount the MLC to the wall or furniture.
   a. Disconnect the MLC's power supply at the power source end (not at the MLC end).
   b. Disconnect the other devices' power.
   c. Secure the faceplate onto a UL-approved electrical wall box, a mounting bracket, a wall, or furniture. See "Mounting the MLC 52," later in this chapter.
   d. Restore power to the MLC and to the connected devices.

UL Requirements

The Underwriters Laboratories (UL) requirements listed below pertain to the installation of the MLC into a wall or furniture.

1. **Elevated operating ambient temperature** — If the equipment is installed in a closed or multiunit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer. For the MLC 52, the Tma is 122 °F (50 °C).
2. **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e. g., use of power strips).

Installation Procedures

The MLC 52 can be installed into a wall or furniture. Follow the instructions appropriate to the mounting option you have selected.

Preparing the site and installing the wall box

The installation of the MLC 52 must conform to national and local electrical codes and to the equipment's size requirements.

Installation using a UL listed wall box is recommended for most mounting options, but mounting brackets can be used instead. To mount the controller using an electrical box and/or a mounting bracket, use one of the rough-in templates provided in appendix B, "Dimensions and Templates," as a guide to measure and mark the hole in the wall or furniture through which the MLC will be mounted. The templates provide measurements for installing the control panel with either an electrical box or a mounting bracket.

NOTE *The templates are not to scale and are provided for reference only.*

- The MLC 52 models include a one-gang plastic faceplate, which can be installed on a standard one-gang electrical wall box that is at least 1.75" deep. Mud rings are also included.
- The MLC 52 VC models have two-gang plastic faceplates, which can be installed in a standard two-gang wall box. Mud rings are also included.
- Also available are optional faceplates that accept the MLC 52 and can be installed into one-gang or two-gang electrical wall boxes or directly mounted into furniture. Templates for these optional faceplates are included with each faceplate.

To prepare the site,

1. Choose a location that will allow cable runs without interference. Allow enough depth for both the wall box and the cables. You may need to install the cables into the wall or furniture before installing the controller. If using an electrical box to wall mount the controller, locate a stud to which the box will be attached.
2. Use the appropriate template and faceplate dimensions in appendix B, "Dimensions and Templates," as a guide to measure and mark the area to cut out. If you are using a mounting bracket, refer to the template that came with the bracket.
3. Cut out the opening in the wall or furniture.

Replacing the faceplate

You can replace the provided plastic faceplate with an optional metal one — the MLM 52 1GWP one-gang metal faceplate (part #70-528-02 or -03) or the MLM 52 VC two-gang metal faceplate (part # 70-538-02 or -03), both of which are available in black or white. You may also wish to replace your plastic faceplate with one of a different color (two plastic faceplates are provided, one black and one white).

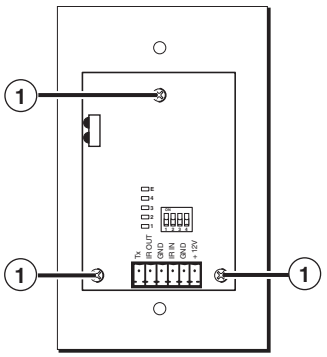
To replace the faceplate,

1. Hold the MLC face down. Use an Extron Tweeker or a small Philips screwdriver to remove the three attachment screws (marked ① in the diagram at right) from the back of the MLC, and keep them to replace later.

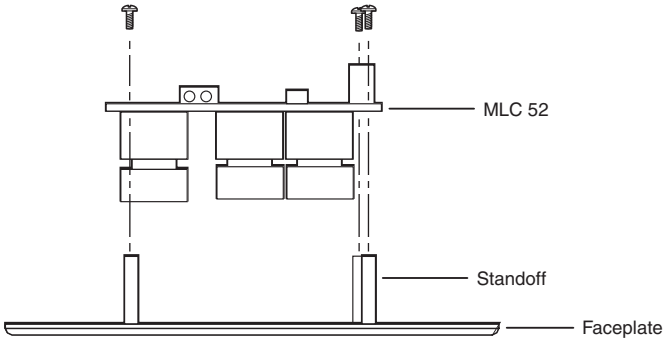
CAUTION *If installing a metal faceplate, do not remove the screws from the **front** of the faceplate.*

2. Lift the MLC off the faceplate.
3. Place the MLC onto the new faceplate, aligning the MLC's buttons with the openings in the new faceplate and the three screw holes in the MLC with the faceplate standoffs.
4. Replace the three screws removed in step **1**, and manually tighten them.

NOTE *Refer to the MLM 52 1GWP and/or the MLM 52 VC user's guides for further information on faceplates for the MLC 52.*



Screws to remove from the MLC faceplate



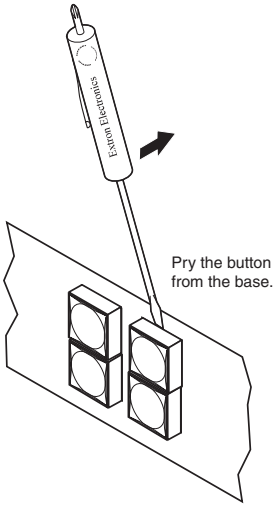
Installing the MLC onto a new faceplate (bottom view)

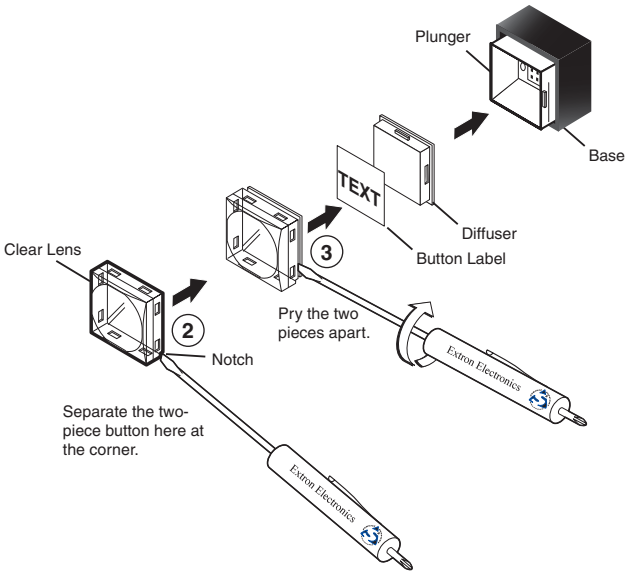
Replacing button labels

The button caps are prelabeled for your convenience by default. However, you can change them with the included button labels.

The button assembly consists of a clear lens cap, the button label, and a white diffuser. (See the diagram below.) Remove the button assembly from the MLC 52 as follows:

1. Remove the button assembly by inserting a small, flat-bladed screwdriver, such as an Extron Tweeker, between the button's base and the diffuser to gently pry the button assembly off the button plunger, as shown in the drawing at right.
2. Locate the small corner notch on the lens cap, and slide the screwdriver between the lens cap and the diffuser. (See ② in the illustration below.)
3. Using a rotating motion of the screwdriver, carefully pry the two pieces apart. (See ③ in the illustration below.)





Replacing a button label

4. Lift out the transparent square label that you want to replace, being careful not to damage the circuits beneath it. You may need to use the small screwdriver to gently pry the label out.

5. Detach one of the preprinted labels or one of the blank labels from the label sheets included with the MLC 52. Remove the label from the backing and, if applicable, peel the protective film from the front of the label.

NOTE *If you want to create customized labels, you can use a label maker, such as the Brother® P-touch®, and clear label material to print text to place on the blank labels. Cut the labels so that they are square and measure ½ inch on each edge.*

6. Insert the new label into the clear button cap, align the white backing plate with the cap, and firmly snap it into place.

7. Gently, but firmly, press the reassembled button into place on the MLC 52 front panel.

8. Repeat steps **1** through **7** as needed to relabel other buttons.

Mounting an electrical box

If you want to install the MLC 52 in an electrical box (in a wall or in furniture),

1. Refer to the appropriate template diagram in appendix B, "Dimensions and Templates," to find out the dimensions of the opening required for the size of the wall box that you are using. If you are using a mud ring with the wall box, refer to the templates provided with the bracket.

2. Using a ruler or tape measure and a soft pencil, draw guidelines on the installation surface (wall or furniture) in the desired orientation and location where the opening for the bracket or wall box will be cut.

CAUTION *The template diagrams in this guide are **not to scale. Do not trace them or use them as patterns on the installation surface.** Use these diagrams only for reference to obtain the dimensions of the hole that needs to be cut. Use a ruler to measure and draw the cutting guidelines.*

3. Cut out the wall or furniture material inside the marked area.

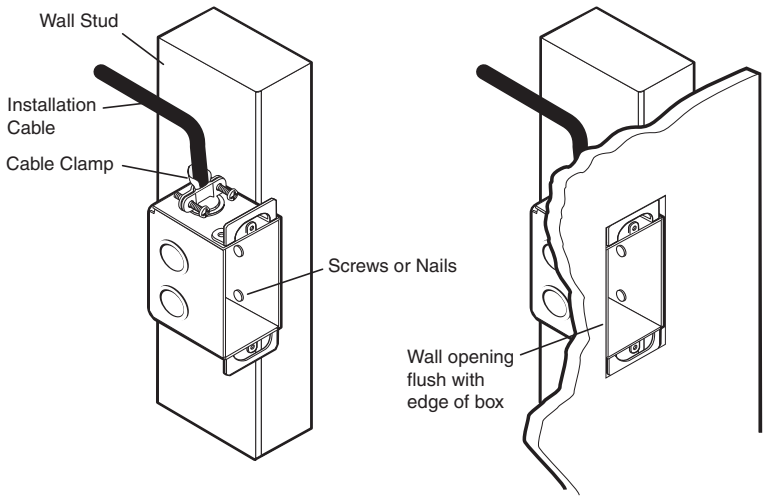
4. Check the opening size by inserting the wall box or mounting bracket into the opening. The equipment should fit easily into the opening. Enlarge or smooth the edges of the opening if needed.

5. Feed cables through the wall box punch-out holes, and secure them with cable clamps to provide strain relief.

6. Exposed cable shields (braids or foil) are potential sources of short circuits. Trim back and/or insulate shields with heat shrink.

WARNING *To prevent short circuits, you can cut back the outer foil shield to the point where the cable exits the cable clamp. Both braided and foil shields should be connected to an equipment ground at the other end of the cable.*

7. Insert the wall box into the opening, and attach it to the wall stud or furniture with nails or screws, leaving the front edge flush with the outer wall or furniture surface. The following illustration applies to all sizes of wall boxes.



Attaching a wall box to a wall stud

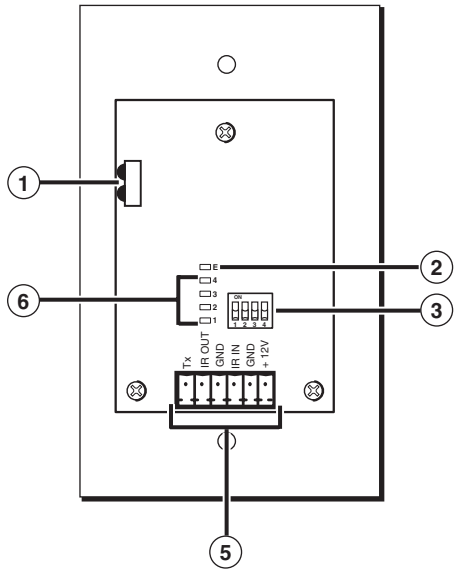
- If you are attaching the wall box to wood, use four #8 or #10 screws or 10-penny nails. A minimum of ½ inch (1.3 cm) of screw threads must penetrate the wood.
- If you are attaching the wall box to metal studs or furniture, use four #8 or #10 self-tapping sheet metal screws or machine bolts with matching nuts.
- **If you are using a mounting bracket (mud ring) with the wall box**, follow the directions included with the bracket to attach the clips that fasten the bracket to the wall or furniture.

8. If desired, replace the faceplate and/or button labels on the MLC. (See "Replacing the Faceplate and Button Labels," earlier in this chapter.)

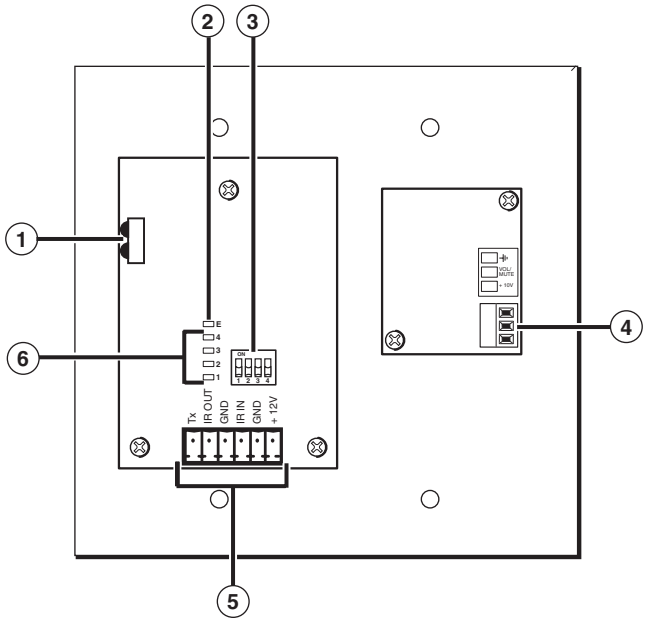
9. Cable and test the MLC before fastening it into the wall box, mounting bracket, or furniture.

Rear panel and cable connections

The following diagrams show the locations of the connector, switches, LEDs, and IR sensors on the back of the MLC 52 with standard and VC faceplates.



MLC 52 rear view



MLC 52 VC rear view

1 **IR learner/transmitter** — These sensors allow for IR control of the MLC and for IR learning. The two LEDs (one for transmitting, one for receiving) send and receive IR signals, enabling the MLC to learn commands and clone configurations from another MLC. The IR remote control must be pointed directly at these LEDs for best results.

The MLC can "learn" IR commands in order to control the display device. IR learning of device control codes is necessary only if there are no RS-232 codes available for that device or if you need to customize the driver. The IR learning procedure is discussed in the "Configuring using IR learning" section of chapter 3, "Operations."

You can also perform IR learning via the Windows-based configuration software. See "Performing IR learning via software," in chapter 5, "Serial Communication."

2 **Enable Macro LED** — The LED located immediately above the four green IR LEDs is labeled E, for Enable Macro. This LED lights amber when you place a button in macro mode. (See "Setting up macros," in chapter 3, "Operations.")

3 **Configuration switches** — When set to "on," these DIP switches place the MLC in IR learning mode or data transfer mode, or disable IR repeats.

- **Switch 1:** Enables IR learning.
- **Switch 2:** Enables data transfer, such as cloning the MLC's configuration onto another MLC 52 (see "Configuring using IR data transfer," in chapter 3, "Operations").
- **Switch 3:** Disables IR repeats during playback. For most applications, this switch is placed in the off position.

Switch 4 is not used.

4 **Volume control (VC faceplate only) connector** — Connect this volume control connector to an amplifier such as the Extron MPA 122 or MPA 181T to enable the volume control knob on the MLC 52 to raise and lower the volume on the display device via the amplifier.

5 **Display control and power connector** — This six-pole, 3.5 mm captive screw connector is used for IR and RS-232 control of the display device and for DC power. (See "Wiring the control connector," in the next section, for information on how to connect supported devices to the MLC.)

NOTE *The RS-232 projector control port is present on this connector but not functional on the IR models. This port is functional only on the RS models.*

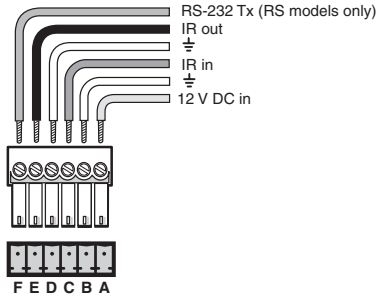
6 **IR learning indicators** — Each button on the MLC front panel has four memory blocks, which can be programmed with up to four IR (or RS-232) commands. The IR learning indicator LEDs provide visual feedback indicating the following:

- Which of the four memory blocks contains a command
- Which of the four memory blocks is ready to be programmed or configured
- The IR learning status of the controller

See "Configuring for IR learning," in chapter 3, "Operation," for details.

Wiring the control connector

The display and source control connector allows you to connect cables for IR devices, RS-232 devices (RS models only), and AC power to the MLC. The illustration below shows the pin assignments of the MLC's control connector that are covered in detail on the following pages.



Pinout guide for the MLC 52 display/source control connector

The ports in this connector, from left to right, perform the following functions:

F (Tx) — Transmits the RS-232 signal for projector control.

NOTE *Although this port is present on both the IR and the RS models, it is functional only on the RS models.*

E (IR out) — Used for connecting an IR emitter to issue IR commands. Up to two emitters can be wired to this port.

D (GND) — Ground for IR and/or RS-232 projector control

C (IR in) — Used for connecting an optional IR Link or IRL 20, so that an IR remote can control the MLC.

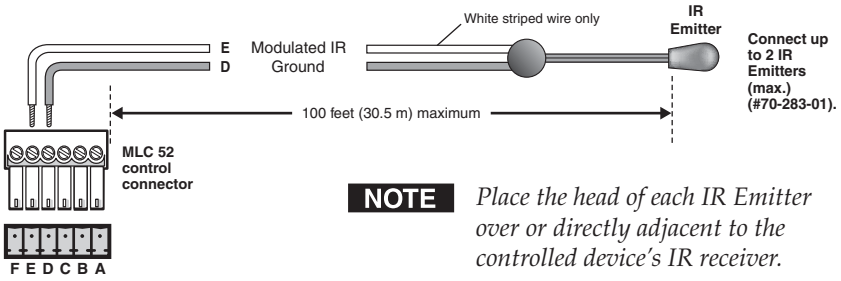
B (GND) — Ground for the +12 VDC power

A (+12 V) — Power input for the product (12 VDC)

NOTE *The two-gang MLC 52 IR VC and MLC 52 RS VC have the same control ports as the one-gang models.*

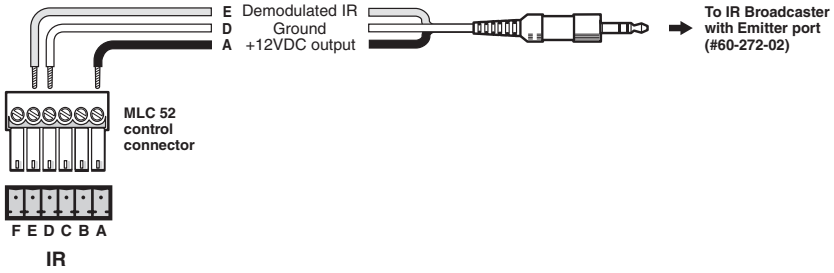
Wiring for IR control

If you intend to control display and/or input devices via infrared (IR) commands from the MLC, you can connect Extron IR emitters or an IR Broadcaster to the IR Out pin of the control connector. Up to two IR emitters can be connected via this connector at one time. Wire the connector as shown in the following illustrations.

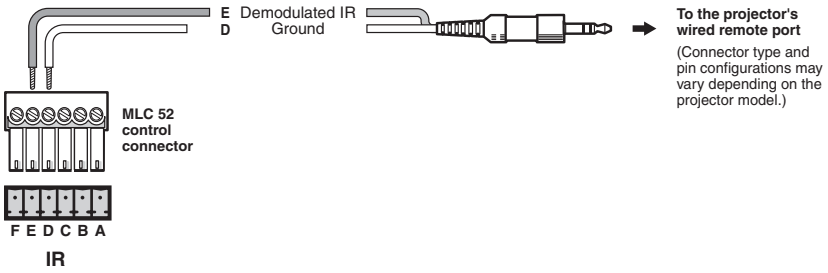


NOTE *Place the head of each IR Emitter over or directly adjacent to the controlled device's IR receiver.*

For the IR Emitter only



For the IR Broadcaster with emitter port


E Demodulated IR
D Ground
To the projector's wired remote port
(Connector type and pin configurations may vary depending on the projector model.)
MLC 52 control connector
F E D C B A
IR

For a wired projector remote port

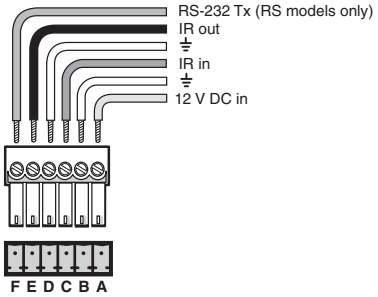
Wiring the control connector for IR

Wiring for RS-232 control (RS models only)

The MLC 52 RS and the MLC 52 RS VC send out RS-232 commands via the Tx port for controlling a display device.

If you have an RS model and want to control the device via RS-232, connect a cable between the device and this 3.5 mm, 6-pole direct insertion captive screw connector. Use the illustration below as a guide to wiring the connector. Wiring varies depending on the device model. In most cases, only the transmit (Tx) and ground connections are needed.

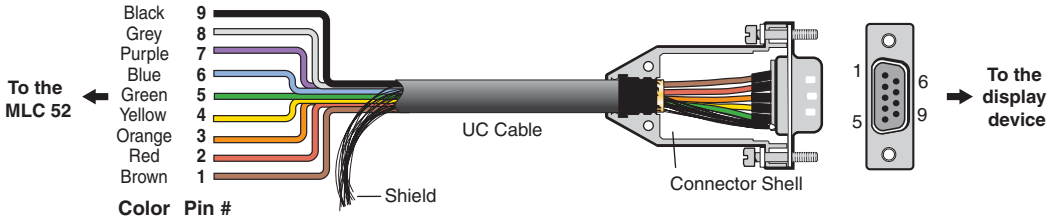
Guides for connecting and controlling specific models of devices are available on the Extron Web site.



Wiring for RS-232 control (RS models only)

Extron recommends using the UC 50' universal projector control cable for this connection. One end of the cable is terminated with a female 9-pin D connector, and the other end is unterminated. The UC 50' cable pin assignments are as shown in the following illustration.

Refer to the display device user's manual for the device's pin assignments in order to determine which of the cable's wires to connect to the MLC's RS-232 pins.



UC 50', 100', and 200' cable color codes

Wiring an IR Link

An optional IR Link or IRL 20 can be connected to the IR In pole of the control connector to enable the MLC to receive IR signals from the IR 452.

NOTE *Only one IR Link **or** one IRL 20 can be attached to the MLC 52 at one time.*

To wire the IR Link for use with your MLC,

1. Prepare the site where the IR Link will be installed and install a wall box, following the directions in the *IR Link User's Manual*, provided with your IR Link equipment.
2. Cut the required length of Extron CTL (Comm-Link) cable to go between the MLC 52 and the IR Link. The power cable length should not exceed 150' (45.7 m).

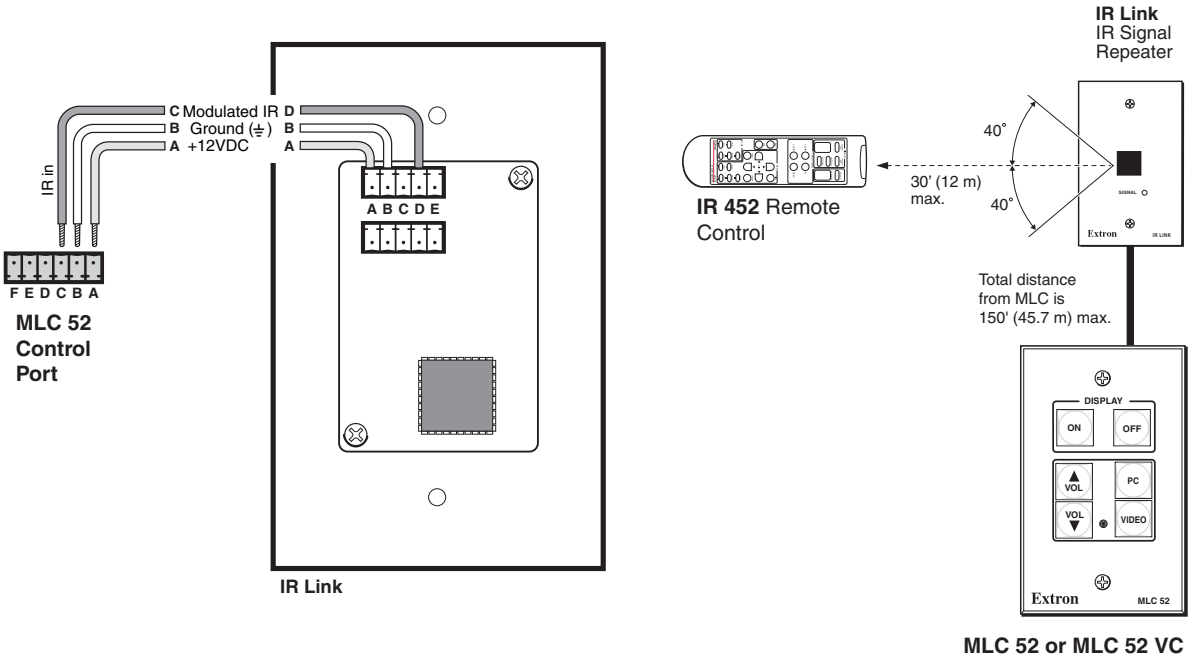
3. Attach a 3.5 mm, 5-pole captive screw connector to one end of the cable and a 6-pole captive screw connector to the other end. Only three wires are required:

   - **A** (MLC) to **A** (IR Link)
   - **B** (MLC) to **B** (IR Link)
   - **C** (MLC) to **D** (IR Link)

   Connect the wires as shown in the illustration below. Connectors are included with the IR Link, but the cable must be purchased separately.

4. Plug the 5-pole connector into one of the IR Link's communications connectors.

5. Plug the 6-pole connector into the rear panel control port of the MLC 52.

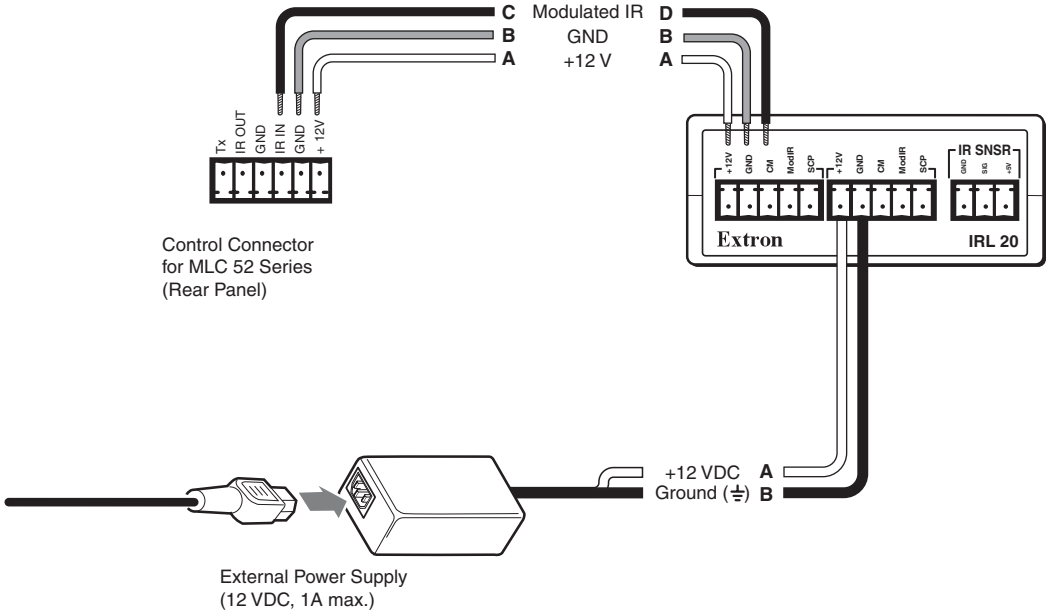


Wiring and using the IR Link for IR remote control

NOTE *Do not connect more than **one** IR Link, either in parallel or in series.*

Wiring an IRL 20

The Extron IRL 20 is a hardwired IR signal receiver that can be used with the MLC 52 and the IR 452 remote control. The IRL 20 receives a signal via its front panel (or an IR sensor) from the IR 452 remote control, and outputs a modulated IR signal via an IR emitter or an IR Broadcaster.



Wiring an IRL 20

Wire and connect the IRL 20 to the MLC 52 as follows:

1. If it has not been done, cut the required length of Extron CTL (Comm-Link) cable to go between the MLC 52 and the IRL 20. See appendix A, "Specifications, Part Numbers, and Accessories," for cable part numbers.

NOTE *The maximum total distance between an Extron controller and the IRL 20 is 150' (45.7 m).*

2. Attach a 3.5 mm, 5-pole captive screw connector to the end of the cable that will be plugged into the IRL 20.
3. Connect the wires on the other end of the cable to the provided 3.5 mm 6-pole captive screw connector.
   - **A** (MLC) to **A** (IR Link)
   - **B** (MLC) to **B** (IR Link)
   - **C** (MLC) to **D** (IR Link)

NOTE *Do not connect more than one IRL 20 or IR Link (either in parallel or in series) to an Extron device.*

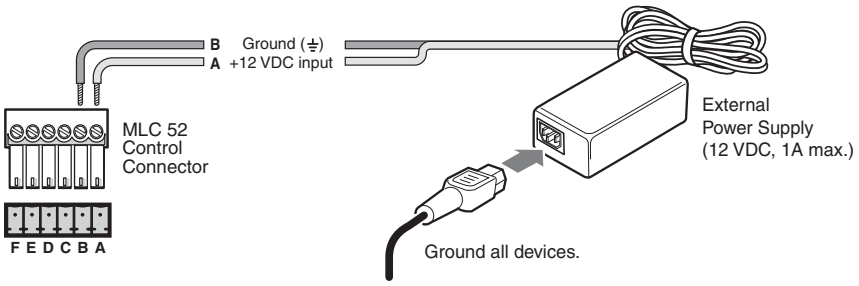
4. Plug the 5-pole connector end of the cable into one of the IRL 20's communications connectors.
5. Plug the 6-pole connector end of the cable into the control port on the MLC 52 back panel.
6. Connect power to the MLC or the IRL 20.

NOTE *+12 VDC power is shared between the MLC 52 and the IRL 20 when they are connected. You can wire the power supply to either the MLC or the IRL 20.*

Wiring the power connector

The control connector also contains a power connector for the MLC 52. Connect the supplied external 12 VDC power supply to this port to power the MLC as shown in the following diagram.

NOTE *The Extron P/S 100 and other Extron power supplies can be used with the MLC 52.*

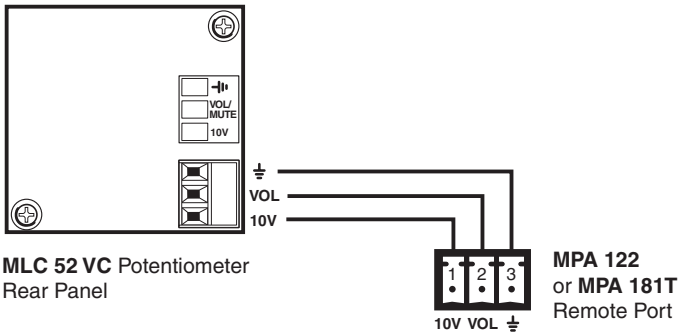


Connecting the MLC 52 to the external power supply

NOTE *Check the power supply's polarity before connecting it to the MLC.*

Wiring the VC port

If you have an MLC 52 IR VC or an MLC 52 RS VC controller, it can be connected to an optional amplifier, such as the Extron MPA Mini Power Amplifier. To set up this configuration, wire the volume control potentiometer to the amplifier as shown in the following diagram.



Wiring the VC potentiometer to the MPA remote volume control port

Set up the volume control, following the instructions in the amplifier's user manual.

Mounting the MLC 52

Once the system has been cabled, configured, and tested, the MLC can be installed in the wall or furniture.

Mounting the MLC to an electrical box or mounting bracket

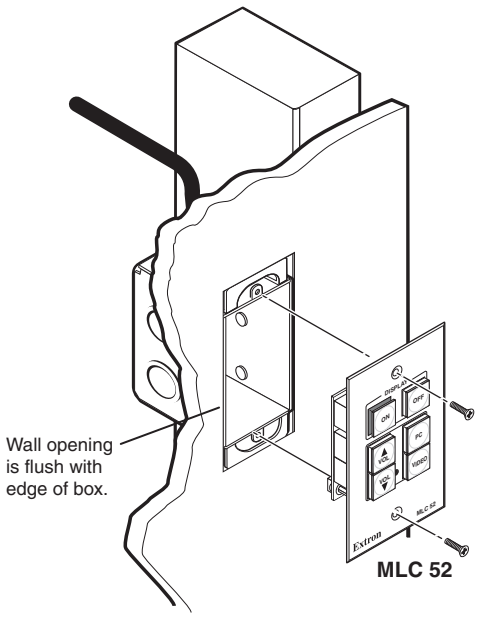
You can mount the MLC 52 in an electrical box or a mounting bracket, as follows:

1. If you want to install a different faceplate, attach the MLC to the desired faceplate using the provided screws. (See "Replacing the faceplate," earlier in this chapter.)
2. Connect all cables to the MLC, and disconnect power at the source.
3. Insert the MLC into the wall or furniture.
4. Secure the MLC to the wall box or mounting bracket with the provided machine screws (as shown in the following illustrations), or attach it directly to the furniture with wood or metal screws.

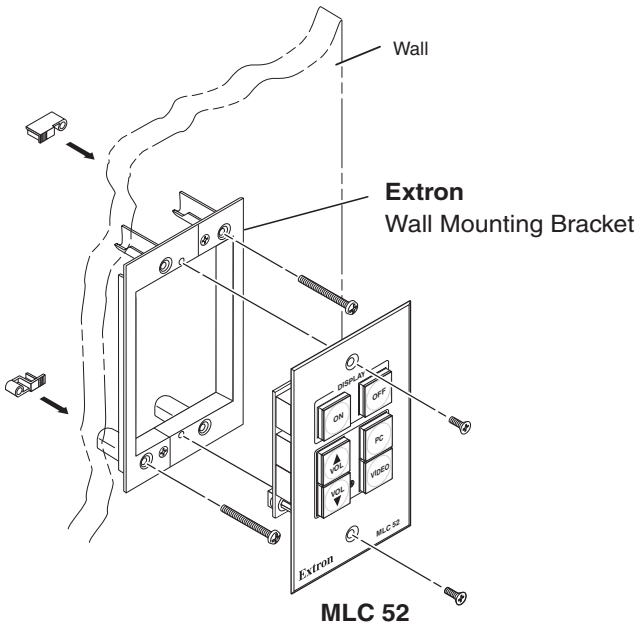
NOTE *If the MLC (and the IR Link, if applicable) is* not *mounted to a grounded metal wall box,*

- *Ground each faceplate directly to an earth ground, or*
- *Tie each faceplate to its circuit board and power supply via a ground pin on one of the connectors.*

Do <u>not</u> tie a product's faceplate to <u>both</u> a separate earth ground and the circuit ground (via a connector pin). If you tie a product to two different ground sources, you may introduce ground loops or other grounding-related problems into the system.



Mounting the MLC 52 in a wall box



Mounting the MLC 52 to a mounting bracket (mud ring)

Mounting the MLC to a wall or furniture

1. With all cables attached to the MLC and power disconnected at the source, insert the MLC into the wall or furniture.
2. Fasten the MLC and faceplate directly to the furniture or wall using wood screws.

NOTE *If the MLC (and the IR Link, if applicable) is* not *mounted to a grounded metal wall box,*

- *Ground each faceplate directly to an earth ground, or*
- *Tie each faceplate to its circuit board and power supply via a ground pin on one of the connectors.*

Do not tie a product's faceplate to both a separate earth ground and the circuit ground (via a connector pin). If you tie a product to two different ground sources, you may introduce ground loops or other grounding-related problems into the system.

Chapter Three

Operation

Display Device Control

Front Panel Features and Operation

Configuring the MLC 52 Using IR

Using the MLC 52 VC Models with the MPA Series Power Amplifiers

Powering the Display Device On and Off

Selecting Inputs

Operating the MLC 52 Using IR Remote Control

Resetting

Locking the Front Panel (Executive Mode)

Operation

Display Device Control

The MLC 52 IR models can control a projector or other display device by using infrared (IR) signals. The RS models can control a display device using IR or RS-232. The MLC must be configured for device control by one of the following methods before it will send commands to the display device:

- An IR or an RS-232 driver file can be loaded from a disk or the Extron Web site and used to configure the MLC.
- RS-232 and IR commands can be added to the MLC buttons from a host computer using the supplied Windows-based configuration software. See chapter 5, "Serial Communication," and the Windows-based configuration software help file for details on setting up the MLC and for downloading, programming, or learning device control commands using the software.
- IR commands can be entered directly from an IR remote control into the MLC through IR learning. IR learning is convenient for installing new or updated commands into the MLC in the field. It can be performed with or without the use of software.
- An MLC 52 can transfer/configure (duplicate or clone its configuration) to another MLC 52 via IR data transfer without the use of cables or software.

Each time a new device driver is used to configure the MLC, previous configurations are replaced (overwritten) by the new driver. Configurations are stored in nonvolatile memory. Therefore, if the power to the unit is interrupted, the MLC retains its settings and configuration.

Front Panel Features and Operation

The MLC 52 front panel contains six buttons, each of which can be programmed with up to four IR or RS-232 commands/functions. It also contains a configuration port, through which the MLC 52 can be connected to a PC's RS-232 port to program the MLC's buttons, update firmware, and save the MLC's current configuration to the PC's hard drive.

The two-gang sized MLC 52 IR VC and MLC 52 RS VC each have an integrated volume control knob. On these models, the two buttons normally used for volume control on the standard, one-gang MLC can be used to control additional outputs or other projector or display functions.

Buttons on the front panel

The front panel backlit buttons light amber when the MLC 52 is powered on. Buttons that are not currently selected and active are lit more dimly (25% brightness) than the selected ones (100% brightness).

When the MLC is delivered, the buttons are labeled. (You can relabel them by replacing the labels with others provided with the MLC. See "Replacing button labels" in chapter 2, "Installation.") You can program commands onto these buttons (up to four commands per button) using IR learning, the Windows-based configuration software via the configuration port, or IR data transfer from a configured MLC 52.

Switch modes

Depending on the driver that you load to your MLC, each of the controller's buttons is preconfigured in one of the following switch modes:

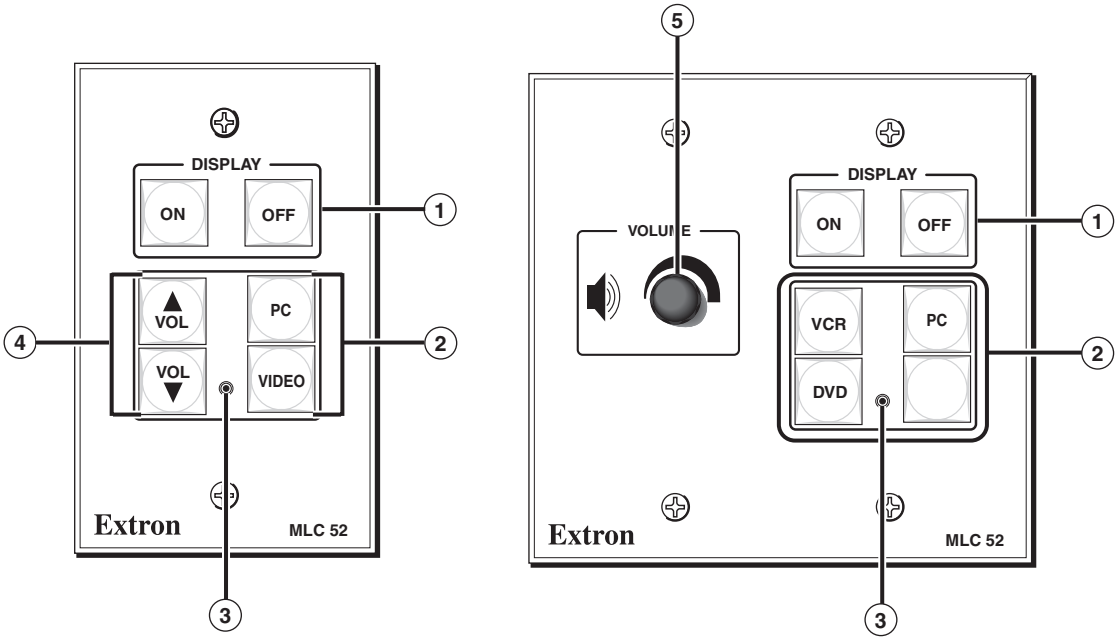
- **Single switch mode**: In this mode, the button operates independently of the other buttons. Pressing a button in this mode does not affect any other button.

- **Input mode**: Buttons in this mode are grouped together so that only one of them can be active at a time. When one button is pressed and activated, it becomes fully lit, while the other (inactive) button(s) are dimmed to 25% brightness. When you press one of the buttons on the front panel that are in input mode, all other buttons in input mode become inactive.
- **Volume mode**: This mode is available only on the standard (not VC) MLC model, and only for the two buttons that are labeled Vol ▲ and Vol ▼. When an RS-232 driver that contains a volume table is part of the configuration, pressing a button in volume mode accesses the driver's volume table. Each press of the button raises or lowers the volume of the display device by the amount specified in the volume table. When in volume mode, the button labeled Vol ▲ always increases the volume; Vol ▼ lowers it.
- **Power mode**: The two Display buttons at the top of the front panel, labeled On and Off, are permanently fixed in power mode. This mode is similar to input mode. The two Display buttons are mutually exclusive; if you press one, the other one becomes unlit.

If you want to change the switch mode of any button, you must use the Windows-based configuration software. (See "Setting up button modes and labels" in chapter 5, "Serial Communication," for the procedure.)

Front panel components

The diagrams below show the front panel features of the standard one-gang MLC 52 and of the two-gang MLC 52 VC.



MLC 52 IR and RS

MLC 52 IR VC and RS VC

MLC 52 front panel

(1) **Display power buttons —** The display power buttons turn power to the projector or plasma display on and off. Because the display device can be only on or off at a given time, these buttons are programmed in an exclusive switch group. (A 2-second hold requirement can be enabled or disabled via the configuration software; see "Entering display device power settings" in chapter 5, "Serial Communication.")

(2) **Input selection buttons —** These buttons are preprogrammed to select input sources. By default, they are in input mode; that is, only one of them may be selected at a time. If you want these buttons to operate independently of each other, use the Windows-based control software to remove the group configuration from them.

NOTE *The input buttons are prelabeled for convenience. You can relabel them using the other labels that are provided. See "Replacing button labels" in chapter 2, "Installation," for the relabeling procedure.*

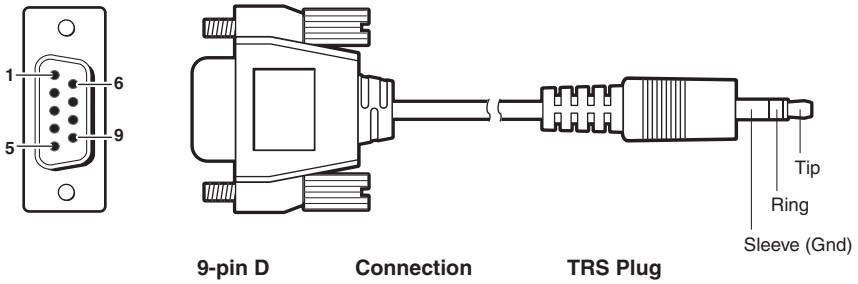
(3) **Configuration port —** This port is used for configuring and communicating with the MLC. Through this port, the MLC receives commands issued via the Windows-based configuration software on your computer.

Use a 2.5 mm TRS to 9-pin D-sub connector cable to connect the MLC to your PC via this 2.5 mm female TRS connector.

NOTE *This cable is an optional accessory that can be ordered from Extron (part #70-335-01)*

The protocol for this configuration port is as follows:

- 9600 bits/second
- 8 data bits
- 1 stop bit
- No parity



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

2.5 mm connector cable for the configuration port

See chapter 5, "Serial Communication," for details about using the configuration software to set up the system, and about downloading drivers.

(4) **Volume adjustment buttons —** (Standard MLC 52 IR and MLC 52 RS only) These two buttons are used to adjust the volume of the projector or display up and down.

If your A/V system does not require the volume up and down function (for example, if the MLC is configured with the VC faceplate containing the volume control knob), you can reprogram these buttons for input selection or additional display device functions.

NOTE *The volume buttons are prelabeled for convenience. They can be changed to other labels that are provided. See "Replacing button labels" in chapter 2, "Installation," for the procedure.*

(5) **Volume control knob —** (MLC 52 IR VC and MLC 52 RS VC only) The volume control knob on the VC models enables you to adjust the volume of the display device via the MPA or other power amplifier.

Configuring the MLC 52 Using IR

The MLC 52 can be programmed/configured via IR by the following methods:

- IR data transfer from an MLC 52 that has been configured
- IR learning from your projector's remote control

Configuring using IR data transfer

You can configure your MLC 52 by transferring button configuration data to it from another configured MLC 52 via the two IR LEDs on the back panels of the MLCs. With this method, you replicate (clone) the other MLC's configuration on your own unit without the use of software or cables.

The following transfers are allowed:

- From an RS model to another RS model
- From an IR model to another IR model
- From an IR model to an RS model

To transmit configuration data via IR, both the transferring and the receiving MLCs must be free of the wall, electrical box, or furniture, and both must be powered on. The MLC that is already configured can be powered by an external power supply, or it can share a power supply with the unit that will be configured.

NOTE *All four MLC 52 models use the same IR data transfer procedure.*

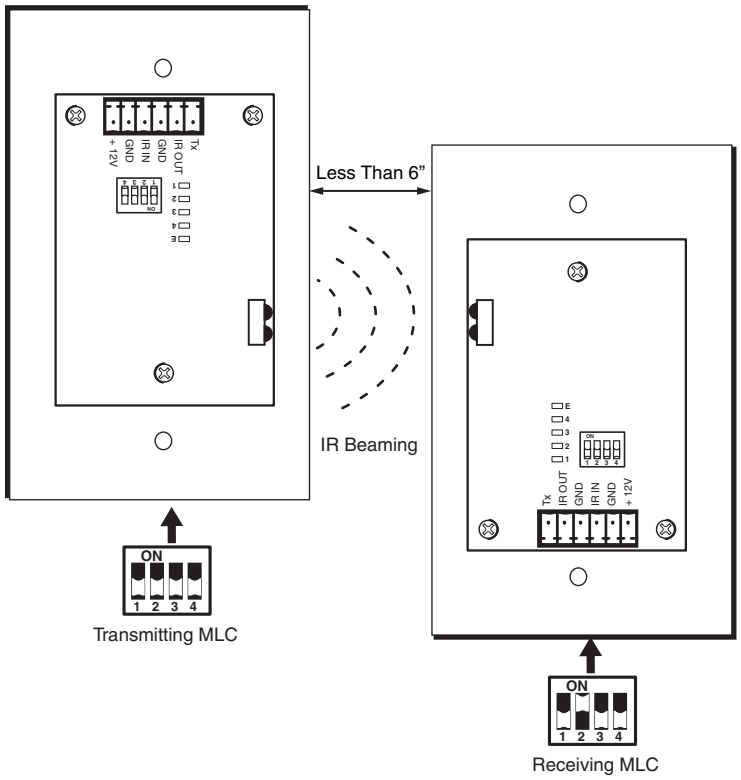
1. On the MLC from which the configuration will be transferred (the donor unit), set all configuration switches to Off (down).

Transmitting MLC

2. On the MLC that will receive the data, set switch #**2** to On (up) and **all the other switches** to Off (down).

Receiving MLC

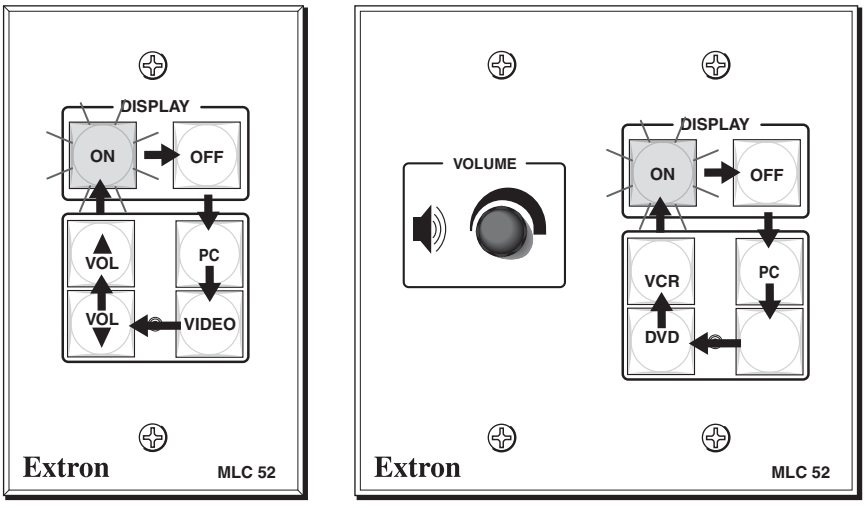
3. Position the two units so that the IR Transmit and Receive LEDs of both MLCs are facing each other, and no more than 6 inches apart. (See the illustration on the next page.)



Setting up transmitting and receiving units for wireless data transfer

The data transfer begins when the receiving unit detects the transmitting unit, and the process takes 15 to 20 seconds to complete. (It may take longer if the transmitting unit has multiple commands programmed on each button.)

The front panel buttons act as data transfer progress indicators. While data is being transferred, the buttons on both the transmitting and the receiving MLCs blink sequentially in clockwise order, starting with the On button in the upper-left corner (see the diagram below). This cycle repeats until transfer is complete.



Order in which the buttons blink during data transfer

After approximately 17% of the data has been transferred, the On button lights and remains lit to maximum brightness. After another 17% has been transferred, the Off button lights to maximum brightness. The buttons continue to light brightly in clockwise order after each increment of 17% of the data has been transferred. When a button becomes permanently lit, the remaining buttons continue to blink in clockwise rotation, until the transfer process is complete and all buttons are remain steadily lit.

The following table shows how each percentage of transferred data is indicated by button lighting:

Percent Complete	MLC 52 Buttons Lit	MLC 52 VC Models Buttons Lit
Less than 17%	On	On
18% to 36%	Off	Off
37% to 54%	PC	PC
55% to 72	Video	(blank)
73% to 90%	Vol ▼	DVD
90% to 100%	Vol ▲	VCR

When the transfer is complete, all buttons on each unit remain brightly lit until a button is pressed on the unit.

NOTE *If the transmission is interrupted (for example, the two units become separated so that the IR LEDs are no longer in direct line of sight of each other), and the conditions necessary for transfer are then restored, the two units restart the transfer process.*

4. When the data transfer is complete, do either of the following:
   - If you are finished performing data transfers, return configuration switch #2 on the receiving MLC to the **off** (down) position. Press any button on both units to return them to the state they were in before the transfer. All buttons dim except for those that were bright previously. Reinitialize the receiving unit by pressing any of its front panel buttons.
   - If you want to repeat the transfer process to configure another MLC 52, repeat steps **2** and **3** for the unit that is to be configured. Press any button on the donor unit. The transfer process restarts.

Configuring using IR learning

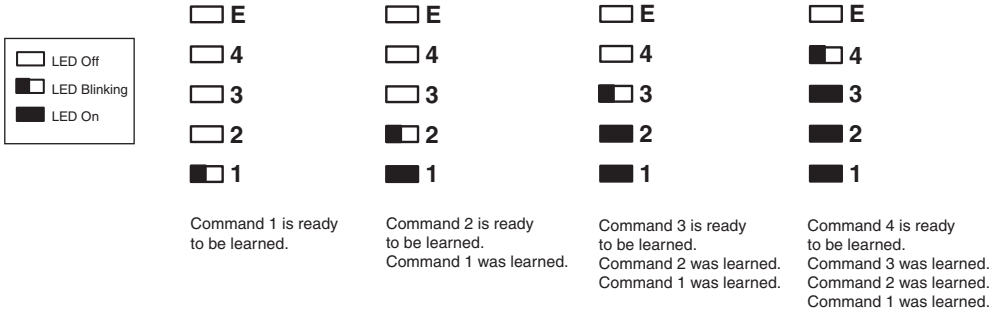
You can also configure the MLC 52 by using IR learning, which does not require configuration software. By this method, you can program the functions on your display device's remote control onto the buttons on the MLC front panel. This procedure must be performed before the MLC is mounted on a wall or furniture, so that the IR Transmit/Receive LEDs are accessible.

To program the MLC via IR learning,

1. Apply power to the MLC 52.
2. On the rear panel, set configuration switch #1 to On (up). All front panel buttons should be dimly lit.

3. Press the button on the MLC that will store the IR code that you want the MLC to learn. The following takes place on the MLC:

   - The front panel button that you pressed begins to blink, indicating that it is ready to be programmed. While the button is blinking (5 seconds), you can program it with the desired command. If no IR command is entered within 5 seconds, the button stops blinking.
   - On the rear panel, the IR learning LED for the next button memory block available for programming begins to blink. (See "IR learning indicators," ⑥ in the "Rear panel/cable connections" section of chapter 2, "Installation," for more information on the IR learning LEDs.)
   - The LED that indicates how many commands have been programmed onto the button illuminates and remains lit.



Activation of LEDs during button configuring

4. Hold the display device's remote control 4 to 14 inches (10 to 36 cm) away from the MLC and point it at the MLC's IR Transmit/Receive LEDs. **Within 5 seconds of pressing the MLC button** (step **3**), press the button on the remote whose function you want the selected MLC button to learn. When the IR command has been learned successfully, the IR learning LEDs blink in rapid progression from the top to the bottom, then back to the top.

NOTE *For repeating command codes, such as those that increment/decrement a function (for example, turning the volume up and down), hold the button on the projector remote control for at least **3 seconds**.*

   If no IR command is detected within 5 seconds, the LEDs and the front panel button time out and stop blinking.

   - If the IR code was learned, the rear panel LEDs blink rapidly in succession from the top down, then back up to the top.
   - If the IR code was not learned, the rear panel LEDs blink in random order.

5. If you want to program another command to the same button (you can program up to four commands on one button), press the button again. The next IR learning LED on the rear panel begins flashing (for example, if you have already programmed two commands on this button, the third LED from the bottom flashes).

   If you do not want to program additional commands on the button, repeat steps **3** and **4** for the next button that you want to program.

6. When you are finished programming buttons on the MLC, set configuration switch #1 on the rear panel to Off (down).

7. Press the buttons that you configured to verify that the commands you entered have been learned. If you have an IR Emitter connected on the IR output, it should blink. (See "Wiring for IR control" in chapter 2, "Installation.")

Removing commands from a button

If you want to delete a command that has been programmed onto a button, you must remove all the commands programmed to that button, as follows:

1. While the MLC 52 is powered on, set configuration switch #1 to On (up).
2. Press the button for which you want to delete commands, then within 2 seconds press the same button again. The IR learning LEDs turn off.
3. Verify that the button's commands were erased by pressing the same button again. If the commands have been erased, only LED #1 (the bottom LED) blinks; the other LEDs remain off.
4. When finished removing commands, set switch #1 to Off (down).

Setting up button macros

Buttons function in either *toggle* mode or *macro* mode. By default, all the buttons (except the On and Off Display buttons) are in toggle mode. This means that each press of the button issues one command — the next in sequence of the four commands programmed to the button (each button can store up to four commands).

In macro mode, a single press of a button issues all the commands (up to four) that have been programmed on that button, in the order they were programmed, at 1.5-second intervals. An example of a button macro application would be turning on multiple projectors/displays by pressing one button, one time.

To program a macro for a button,

1. Ensure that power is applied to the MLC 52.
2. Set configuration switch #1 on the rear panel to On (up). All front panel buttons light dimly.
3. Program the buttons with the desired commands. See "Configuring using IR data transfer" or "Configuring using IR learning," earlier in this chapter, for programming procedures.

NOTE *You must program the commands onto the button prior to setting it for macro.*

4. To put the button in macro mode, press and hold it for 3 seconds. The orange LED on the back panel, labeled "E," flashes rapidly five times, then turns off, indicating that the button is now configured for macro mode. Release the button. The next time that the button is pressed while configuration switch #1 is in on position, the orange "E" LED lights, indicating that the button is in macro mode.

   To take a button out of macro mode, press and hold the button for 3 seconds. The orange "E" LED turns off.

5. Set configuration switch #1 to Off. Verify that the commands have been properly learned by pressing the button you programmed. The commands should be issued in succession at 1.5-second intervals.

NOTE *A button is able to learn commands while in macro mode if any of its four command memory blocks are open (not yet programmed with a command).*

Configuring a single button for input source selection

If you want to use only one button to select your input sources, you must program the button with one command for each source (up to four). Only one button has to learn IR commands; and it has enough memory blocks to learn four input selection commands. To use this programmed button to select an input, you must press it repeatedly to cycle through all the inputs until you reach the desired one.

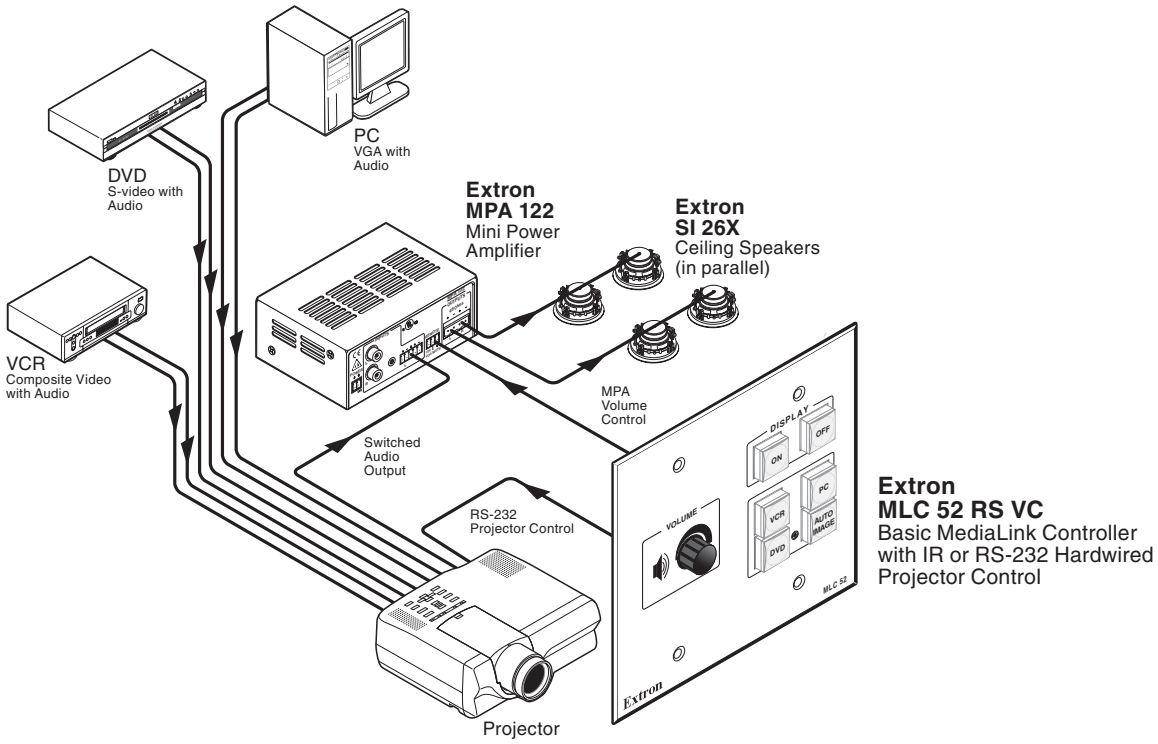
To program a single button to select multiple inputs,

1. Disconnect power from the MLC 52.
2. To make the one programmed button easily recognizeable, r eplace all but one of the input (Video, PC, DVD, and/or VCR) button labels with the provided Not Used label, or remove the input label(s) and leave the button(s) blank.
3. Apply power to the MLC.
4. Set configuration switch #1 to On (up). The front panel buttons light dimly.
5. Press the MLC button that will store the input selection IR codes. The button blinks for 5 seconds, during which time it is able to learn codes. On the rear panel, the first (bottom) IR learning LED starts flashing.) (If a command is not entered within 5 seconds, the button and LED stop blinking, and you must press the button again to put it in back in learn mode.)
6. Within 5 seconds, press the display device remote control button from which the MLC button will learn the first input selection command. If the command has been learned successfully, the Learning LEDs on the rear panel blink in rapid progression from the top LED to the bottom, then back to the top.
7. To program a second input selection command on the same button, press the button again. The button and the second rear panel IR learning LED begin to blink. On your display device's remote control, press the next button whose function you want the MLC button to learn.
8. Repeat the procedure described in steps **5** and **6** for additional commands you want to add to the button you are programming. Each MLC button can be programmed with up to four commands.
9. When finished programming the input selection button, set rear panel DIP switch #1 to Off (down). Verify that the button has been programmed correctly by pressing it repeatedly to cycle through the inputs.

Using the MLC 52 VC Models with the MPA Series Power Amplifiers

The dedicated volume control knob on the MLC 52 IR VC or the MLC 52 RS VC controls the audio output of an Extron MPA 122 or MPA 181T power amplifier, to which speakers for the system are connected.

The following diagram shows an example of a system that uses an MLC 52 VC model with an MPA amplifier.



Application diagram using an MLC 52 VC with an MPA series power amplifier

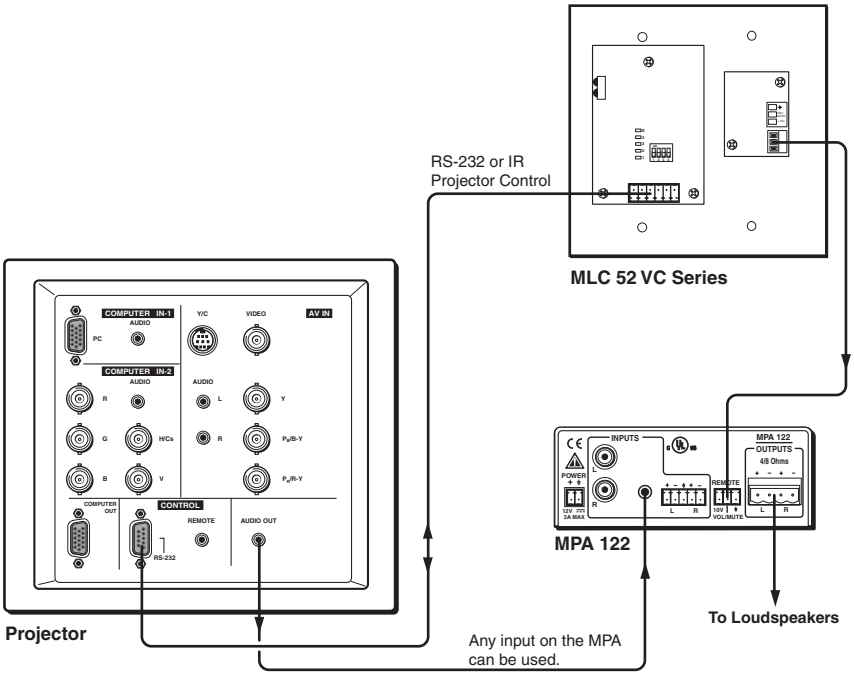
Requirements for the MLC 52 VC with volume control knob

To set up and operate a system that contains an MLC 52 VC model, which has a volume control knob on the faceplate, and an Extron power amplifier, you must ensure that the following conditions are met:

- The projector must have dedicated video and audio inputs for each source used in the system.
- The projector must have a **switched** audio output. On most projectors, this connector is labeled as "Monitor Output" or "Audio Output," as shown in the following illustration. With a switched audio output, the projector outputs the audio from the selected video source.
- The system must incorporate an Extron MPA series power amplifier.

Wiring and connections for the MLC 52 VC models

Connect the cables to the MLC 52 IR VC or MLC 52 RS VC controller with the MPA Series amplifier as shown in the diagram below and on page 2-15.



Wiring an MLC 52 VC controller and an MPA series power amplifier to a typical projector

NOTE *Audio is now controlled from the MPA instead of from the projector. For best results, ensure that the audio volume of the projector is set to maximum (assuming that the monitor output for audio is variable).*

Configuring the MLC 52 IR and MLC 52 RS Vol buttons

By default, the MLC 52 has two buttons on the front panel programmed for volume control (Vol ▲ and Vol ▼). However, on the MLC 52 IR and RS VC models, these buttons are not needed for volume control and can be programmed for other uses. To reprogram the Vol buttons, you can use IR learning (see "Configuring using IR learning," earlier in this chapter,) or the Windows-based configuration software (see chapter 5, "Serial Communication").

Powering the Display Device On and Off

The Display On and Off buttons on the MLC 52 front panel are used to turn the projector or other display on and off.

Powering on

Press and release the MLC 52's On button to turn the display device's power on. The MLC sends an RS-232 or IR power-on command to the projector, and the On button blinks for 4 seconds, then remains steadily lit.

Powering off

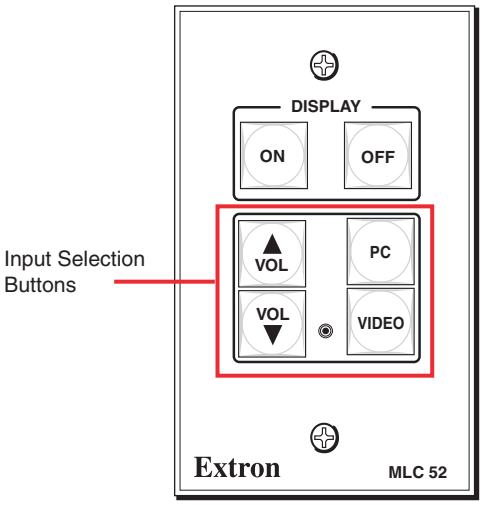
To turn the projector/display off, press the Off button. The button blinks for 4 seconds, then remains steadily lit.

(A 2-second hold feature, requiring you to press and hold the Off button for 2 seconds in order to turn off the display device, helps prevent accidental powering off of the projector or display. This feature can be disabled and enabled through the configuration software. See "Entering display device power settings," in chapter 5, "Serial Communication," for further information.)

Selecting Inputs

The four buttons below the Display On and Off buttons on the MLC 52 front panel can configured to select inputs on the display device. The PC and Video buttons have been preconfigured to select inputs — the desktop or laptop computer (PC); the VCR or DVD (Video).

Using IR learning, IR data transfer, or the Windows-based configuration software, you can reconfigure these buttons and/or add commands to them to select other inputs if desired. The two volume (Vol) buttons on the standard MLC can be configured to select inputs as well, if you do not need them to control projector or display volume. Up to four commands can be programmed on any button. See "Using the MLC 52 Configuration Program," in chapter 5, "Serial Communication," for information on configuring MLC buttons.



Input selection buttons on the MLC 52 front panel

To select an input, press and release the appropriate input selection button. The command that was programmed in the button's first memory block is executed.

- All buttons are lit at 25% intensity while the MLC receives power. A selected (active) input button lights more brightly than the other buttons.
- If there is more than one input selection command programmed in the button's memory blocks, you can execute the commands in memory blocks 2, 3, and 4 by pressing the button a second, third, and fourth time.

  For example, if you have programmed memory block 1 on the Video button for a VCR, and memory block 2 for a DVD player, you would press and release the Video button once to select the input to which the VCR is connected on the display, then a second time to select the input to which the DVD player is connected on the display. (Pressing it a third time reselects the VCR, etc.)

- If an input selection button is in macro mode, pressing the button once executes all the commands stored on that button, in memory block order (i.e., the command in memory block 1 is performed first, then block 2, etc.). See "Setting up button macros," earlier in this chapter, for more information.

Operating the MLC 52 Using IR Remote Control

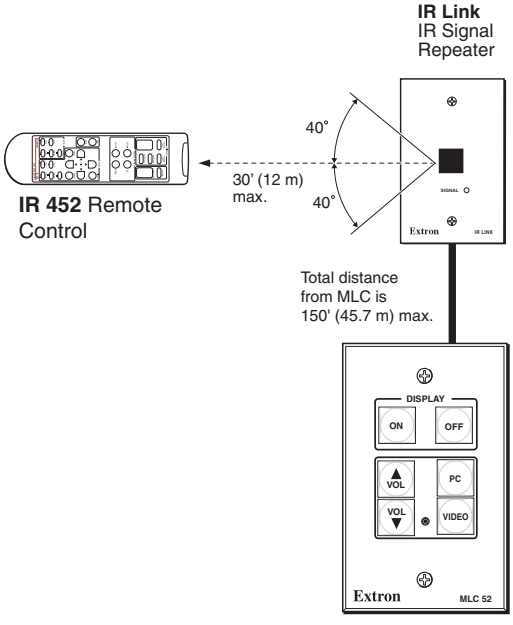
The MLC 52's optional hand-held IR 452 remote control can be used in conjunction with the MLC 52 to operate your projector, plasma display, and input devices. The IR 452 remote control is delivered with commands for a variety of device functions (for example, VCR On, VCR Off, Stop, Pause). These commands can be programmed onto the MLC's buttons only via the Windows-based configuration software. (See "Assigning functions to buttons" in chapter 5, "Serial Communication."

NOTE *The IR 452 cannot perform the volume knob's function on the MLC 52 IR VC or the MLC 52 RS VC. All other functions on the IR 452 are available on the MLC 52 VC models.*

The IR 452 remote control also requires the optional IR Link or IRL 20 in order to send commands to the MLC, which in turn issues the commands to the input or output devices.

1. Wire the IR Link or IRL 20 to the MLC 52 and mount it. (See "Wiring for IR remote control" or "Wiring the IRL 20," in chapter 2, for IR Link or IRL 20 wiring instructions. See the IR Link or the IRL 20 user's guide for mounting instructions.)
2. Using the MLC 52 Windows-based configuration software, program the desired buttons on the IR 452 with the commands available with the currently loaded driver.

   (See "Assigning functions to buttons" in chapter 5, "Serial Communication," for button programming instructions.)
3. To operate a device using the IR 452, point the remote control directly at the IR Link or IRL 20 signal pickup window. The IR 452 has a range of approximately 30' (12 m) within 40 degrees on either side of the axis (see the illustration at right).
4. Press the button for the function you want to perform. The following takes place:
   - The remote control sends the pressed button's programmed command via infrared (IR) signal to the IR Link or IRL 20.
   - The IR Link or IRL 20 sends the command to the MLC through the MLC's IR IN pole on the control connector, to which the IR Link or IRL 20 is connected.



Using the IR Link with the MLC 52 and the IR 452

- The MLC recognizes the command it receives via the IR IN pole, and responds as if its own equivalent button were pressed, issuing the command to the appropriate device.

See "Wiring an IR Link" in chapter 2, "Installation," for information on wiring the IR Link. See "Wiring the IRL 20," also in chapter 2, for information on connecting the IRL 20 signal receiver.

NOTE *Setup operations cannot be performed from the IR 452 remote control.*

Buttons on the IR 452 remote control

The buttons on the optional IR 452 Remote Control duplicate the MLC 52's front panel controls for normal operation. The MLC responds to commands from the IR 452 as if the corresponding button were pressed on the controller.

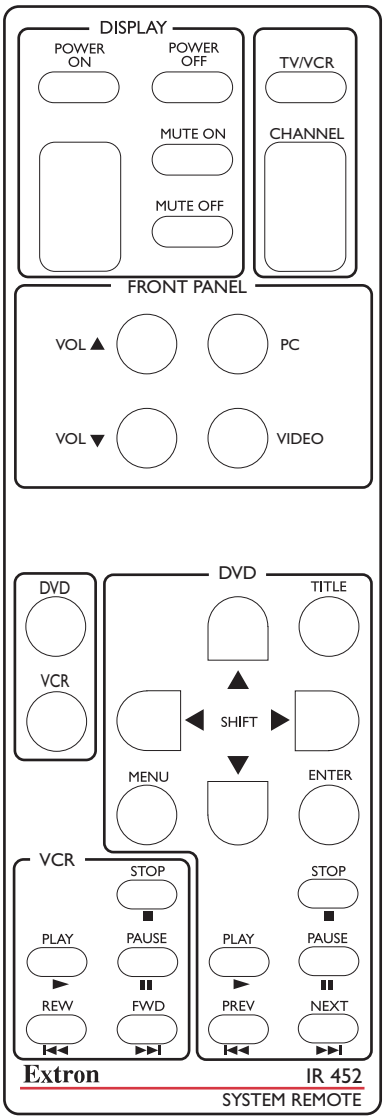
From a distance of no more than 30 feet and within 40 degrees of the axis, the IR 452 sends infrared (IR) signals to an MLC 52 via the optional IR Link or IRL 20.

NOTE *MLC 52 configuration cannot be performed from the IR 452.*

The IR 452's Display Power On and Power Off buttons and the VCR and DVD control buttons cannot control a device through the MLC until commands have been stored in the MLC's memory. The IR 452's VCR buttons control the first (lowest address numbered) VCR connected to the MLC, while the DVD buttons control the first (lowest address numbered) DVD connected to the MLC.

NOTE *The IR 452 cannot control the volume knob function on the MLC 52 IR VC or the MLC 52 RS VC. All other functions on the IR 452 are available on the MLC 52 VC models.*

Commands are transmitted from the MLC's control connector (via hard wiring) and IR ports (via IR Emitters or the optional IR Broadcaster) when the corresponding button is pressed on the IR 452 or on the controller's front panel.



Resetting

In the event that the MLC 52 needs to be reset, you can do so by one of the following methods:

Factory firmware reset — Press and hold the bottom right button (the Video button on standard models or the blank button on VC models) while applying power to the MLC. This method resets the MLC firmware to the version with which the unit was delivered from the factory. Any codes that you previously programmed for the buttons remain in effect.

Factory configuration reset — Press and hold the On and Off (Display) buttons simultaneously while applying power to the MLC. This method removes all codes from the buttons.

You can also reset the MLC to its factory defaults via the Windows-based configuration software. See "Resetting" in chapter 5, "Serial Communication."

Locking the Front Panel (Executive Mode)

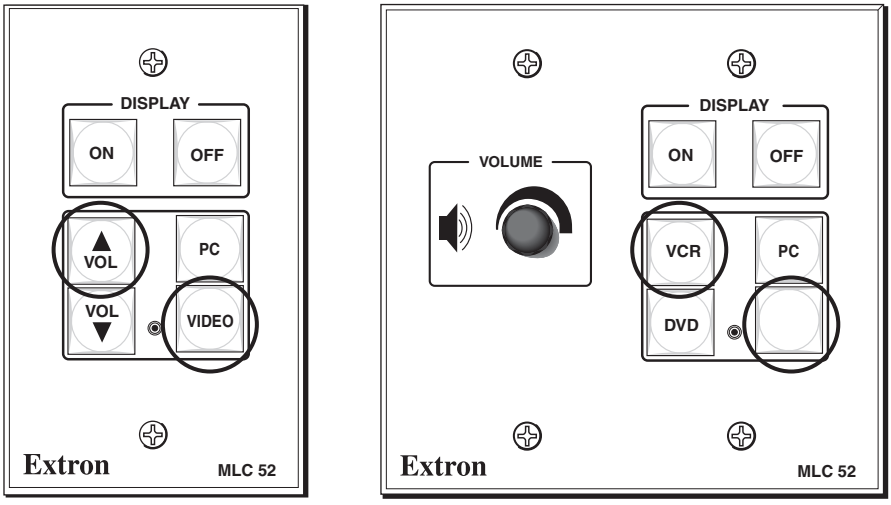
To prevent access by unauthorized users, or accidental presses of the button issuing unwanted commands to devices, the front panel controls can be locked using executive mode. When the MLC 52 is in executive mode, all front panel functions are locked, so that pressing the buttons has no effect.

If a button is pressed while the MLC 52 is in executive mode, all the front panel buttons blink, indicating that the front panel is locked.

To place the MLC in executive mode,

1. Power off the display device. Executive mode cannot be enabled if the device is on.
2. On the standard MLC 52 models, press and hold the Vol ▲ and Video buttons simultaneously for 5 seconds.

   On the VC models, press and hold the unlabeled button (bottom right) and the VCR button simultaneously for 5 seconds.



Buttons to press and hold for executive mode

When the MLC enters executive mode, all front panel buttons flash three times, then return to their original state.

To exit executive mode, press the same two buttons again, holding them for 5 seconds.

Chapter Four

Special Applications

Application 1: Using Multiple Sources with an MLC 52

Application 2: Controlling Projectors that Require Power Off Confirmation

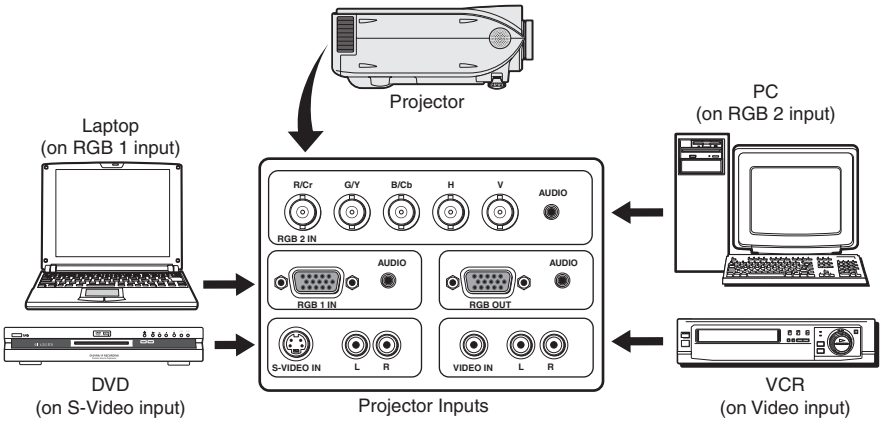
Application 3: Controlling Projectors That Have Multi-coded IR Functionality

Special Applications

This chapter describes some special types of applications that represent unique conditions. For the MLC 52 to operate properly in these situations, it is important that the controller be configured correctly. On the following pages, three application examples are described, along with their requirements for the MLC 52.

Application 1: Using Multiple Sources with an MLC 52

Following is an example of an application in which the system contains more than two inputs. This system has two PC inputs (a laptop and a desktop) and two video inputs (a VCR and a DVD).



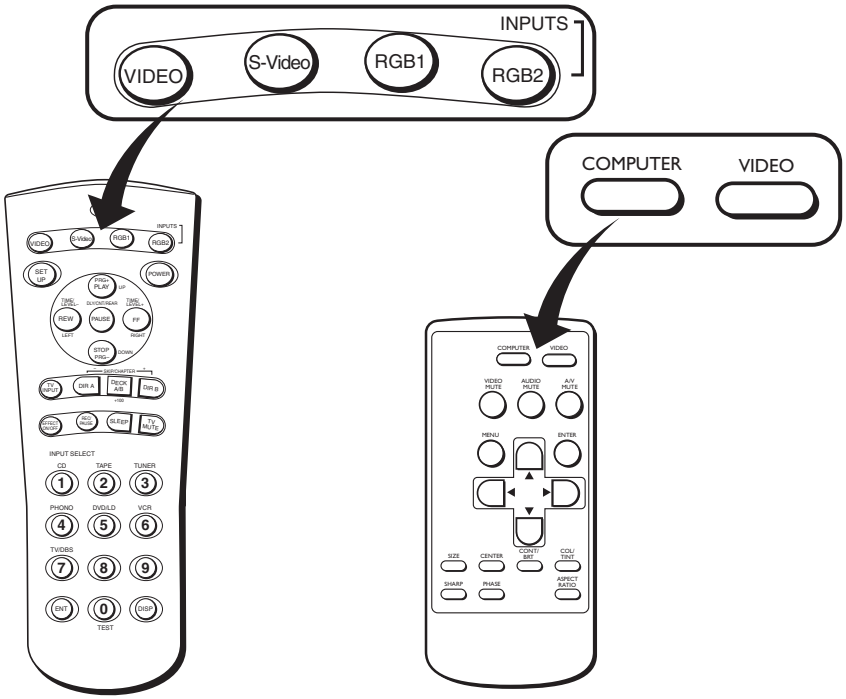
Application 1: Projector with more than two inputs

For best results, choose a projector that has dedicated audio and video input connectors for each PC and each video source. Do not use a projector on which multiple video inputs share one audio input.

The MLC 52 must be configured differently, depending on the type of projector remote control that will be used, and on whether the MLC will use IR or RS-232 projector control. Because each button on the MLC 52 can store up to four commands per button, the PC and Video buttons on the MLC should be programmed as shown in the illustrations on pages 4-4 through 4-6.

- **IR control:** If the projector is to be controlled by the MLC 52 using IR, its IR remote control will have one of the following types of button configurations for video selection:
  - **Projector remote control type A:** A different remote control button is used for each video input source. Each button selects the input source with the signal type that matches the button's label (for example, the RGB1 button might select the laptop computer; RGB2, the desktop PC.)
  - **Projector remote control type B:** One remote control button is used for all video formats (RGB, S-video, and/or composite video). This type of button must be pressed repeatedly to toggle through all the inputs with the same format.
- **RS-232 control:** If the projector is to be controlled by the MLC 52 RS via RS-232 commands, the projector typically has a discrete (specific) command for selecting a particular video input. That is, the projector does not have an RS-232 command to toggle through its video inputs. See chapter 5, "Serial Communication," for procedures for RS-232 programming.

Programming buttons for an IR controlled system



Projector Remote Type A

Projector Remote Type B

Examples of projector remote control types A and B

The illustrations on the following pages show the commands to program to the memory slots on the MLC's input selection buttons from the two types of projector remote controls, when the projector is controlled via IR. Determine which of these two types most resembles your projector's hand-held remote control, then select the appropriate instruction set from the following sections to program IR commands to your MLC 52.

Projector remote control type A (application 1)

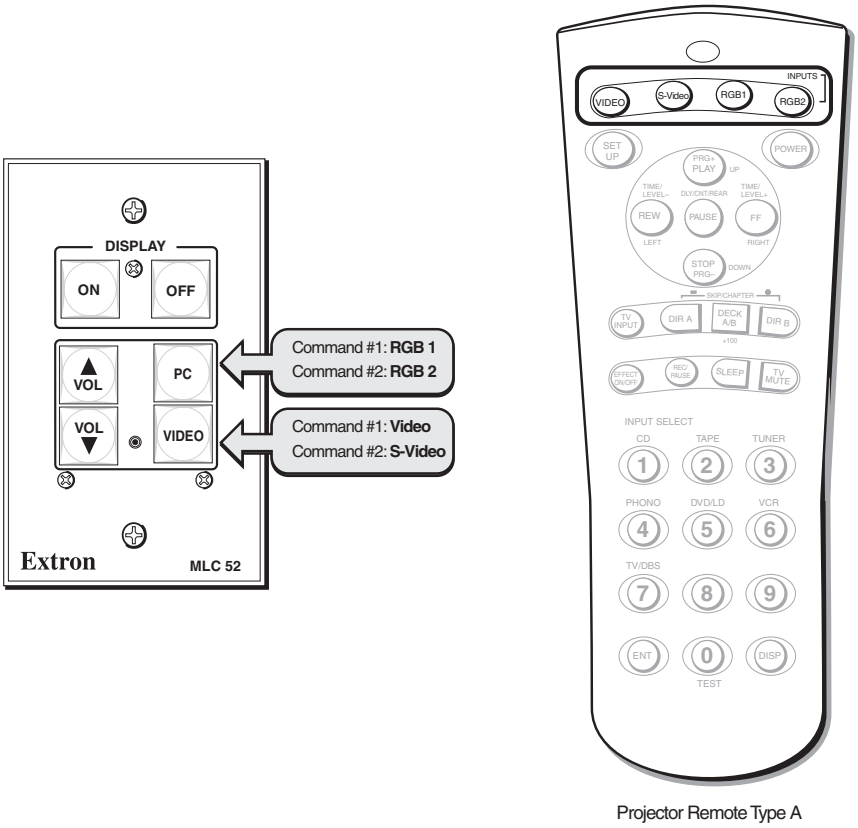
This remote control has a discrete button for each input. Two buttons are designated for RGB inputs, one for S-video, and one for video (composite).

- Use IR learning to program the command from each of the projector remote's RGB input selection buttons onto the MLC's PC button.
- Use IR learning to program the commands from the projector remote's Video button and S-video button onto the MLC's Video or blank (VC models) button.

(See "Configuring using IR learning" in chapter 3, "Operation," for the IR learning procedure.)

The MLC now has **two** commands each on the PC and Video or blank (VC models) buttons. This enables you to switch between the two PC inputs by repeatedly pressing the PC button, and between the two composite/S-video inputs by repeatedly pressing the Video or blank button.

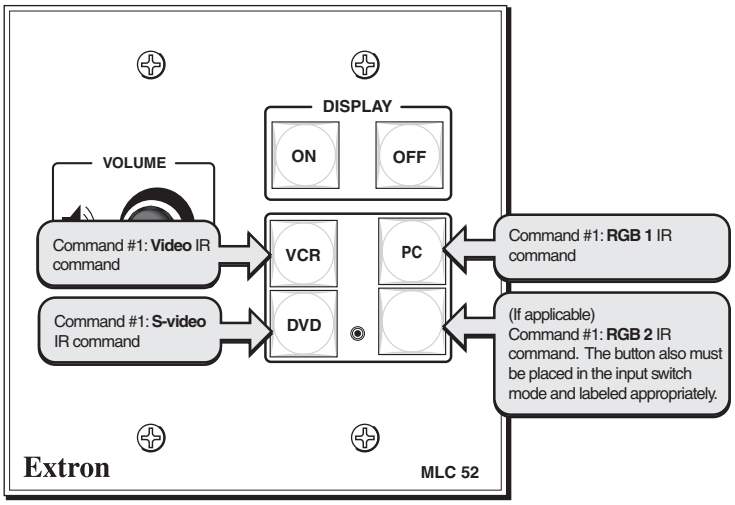
If you are using an MLC 52 IR or an MLC 52 RS (one-gang models) with a type A remote control, program the buttons using the following scheme:

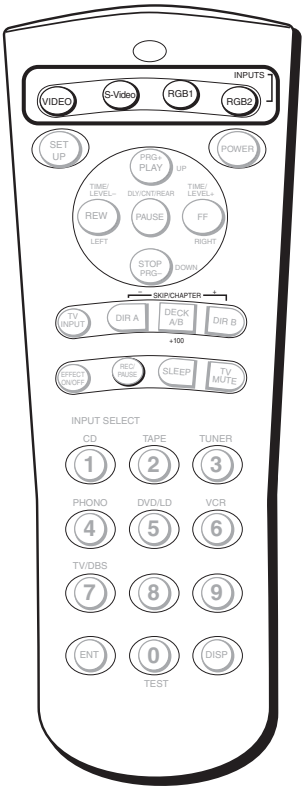


Projector Remote Type A

Programming MLC 52 input selection buttons from a projector remote control type A

If you are using an MLC 52 IR VC or an MLC 52 RS VC (two-gang models) with a type A remote control, program the buttons using the following scheme:





Projector Remote Type A

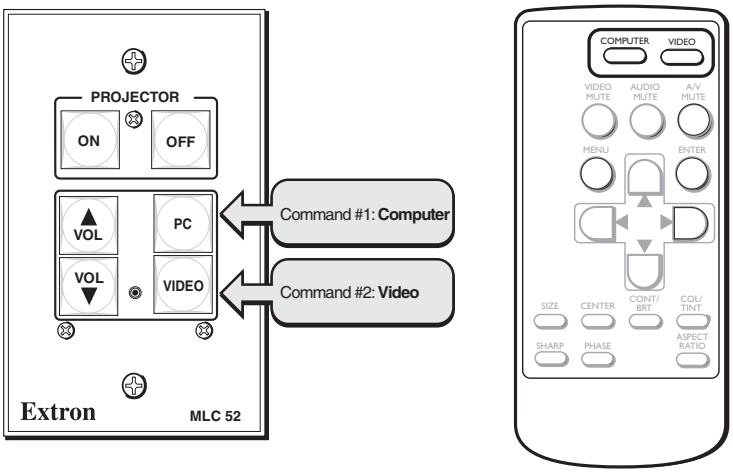
Programming the MLC 52 IR VC and MLC 52 RS VC with a projector remote control type A

Projector remote control type B (application 1)

This remote control has only two input buttons — one for the RGB inputs and one for the S-video and composite video inputs. Each of these buttons contains one command that causes the projector to toggle between inputs.

- Program the command from the projector remote control's Computer or RGB button onto the MLC's PC button.
- Program the command that is on the projector remote control's Video button onto the MLC's Video button.

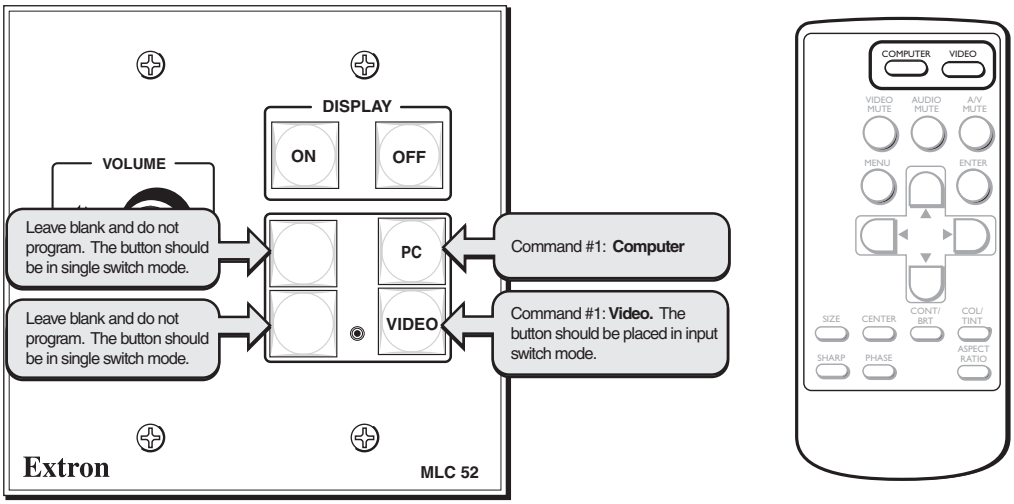
The MLC now has **one** command each on its PC and Video buttons. You must still repeatedly press an input button to switch between selected sources; however, the button actually contains only one command (a projector input toggle command).



Projector Remote Control Type B

Programming MLC 52 input selection buttons from a projector remote control type B

If you are using an MLC 52 IR VC or an MLC 52 RS VC with a type B remote control, program the buttons using the following scheme:



Projector Remote Control Type B

Programming MLC 52 IR VC and MLC 52 RS VC with a projector remote control type B

Programming buttons for multiple inputs on an RS-232 controlled system

If the MLC 52 RS is to control the projector via RS-232, the projector's remote control does not need to be involved. Program the MLC buttons directly via the front panel configuration port using Windows-based configuration software (see chapter 5, "Serial Communication," for information on using these control methods).

1. Program commands 1 and 2 on the PC and Video buttons with the projector's RS-232 command for discrete input selection.
2. The MLC now has **two** commands each on the PC and Video buttons. Press these buttons repeatedly to switch between the two input selection commands that you entered on each button.

Application 2: Projector Requiring a Power Off Confirmation

Some projectors controlled via IR require the Power Off button on the hand-held remote control to be pressed twice to turn off the projector. These projectors usually present a prompt (similar to the one shown below) on the image, instructing you to press the Power Off button again to confirm your intent to power off the projector. (If the projector is controlled via RS-232, this prompt is usually not displayed.)

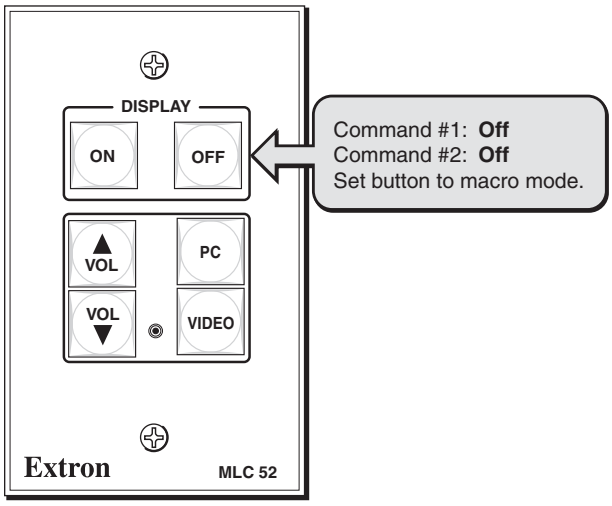
Typical projector power off confirmation prompt

Configuring the MLC 52 for a power-off confirmation

The MLC 52 can be configured so that the projector Power Off button does not need to be pressed twice for confirmation. Using the macro mode feature, you can send two power off commands sequentially from a single press of the MLC's Off button.

To configure the MLC's Off button to issue both a power off and a power off confirmation command,

1. Ensure that power is applied to the MLC 52.
2. Set configuration DIP switch #1 on the rear panel to On (up).
3. Program the MLC's Off button's first two command memory blocks (commands #1 and #2) with a projector off command. See "Configuring using IR learning" in chapter 3, "Operation," for procedures.



Programming the Off button for a projector that requires a confirmation

4. Put the MLC's Off button that you have just programmed into macro mode by pressing and holding the button for 3 seconds. The orange LED on the back panel, labeled "E," flashes rapidly five times, then turns off, indicating that the button is now configured for macro mode.
5. Set configuration DIP switch #1 on the MLC rear panel to Off (down).

Now, with one press of the MLC Off button, you can issue the two projector off commands needed to both answer the projector's confirmation prompt and turn the projector off. The commands are issued in succession at 1.5-second intervals.

Application 3: Controlling Projectors That Have Multi-coded IR Functionality

Certain projectors, such as Philips projectors, have multiple IR codes for the same function. Projectors with multi-coded IR functionality issue two commands for each IR remote control button. Command "A" is initiated by the first press of the button; command "B," by the second press. Because the buttons on the MLC 52 can store up to four commands, it is ideal for projectors of this type.

If controlled via RS-232, projectors that have multi-coded IR functions typically have a specific RS-232 command that selects or performs each desired function. Therefore, there is no command "A" or "B" for RS-232 control.

Configuring the MLC 52 for multi-coded IR functionality

This section provides instructions for using IR learning to program multiple input selection commands onto the MLC 52's buttons from two common types of hand-held projector remote controls that have multi-coded IR functionality.

NOTE *For best results, select a projector that has a dedicated audio and video input for each source used in the system. Video and audio should not share an input.*

Projector remote control type A (application 3)

This remote control has a discrete button for each input. Two buttons are designated for RGB inputs, one for S-video, and one for video (composite). Each of these input selection buttons on the type A remote control has a command "A" and a command "B" coded on it.

Following these steps, use IR learning to program the input selection commands from the projector's type A hand-held remote control onto the MLC's PC and Video buttons.

Programming RGB inputs — projector remote control type A

1. Place the rear panel configuration DIP switch #1 in the On (up) position to enable learning mode.
2. Using IR learning, program command "A" from the RGB 1 input selection button on the projector's remote control into memory block #1 of the MLC 52's PC button as follows:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED should be flashing.
   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 1 button on the projector's remote control. The MLC has learned command "A" for RGB 1.

NOTE *When a command has been successfully learned, the IR learning LEDs on the MLC rear panel flash in rapid progression from the top to the bottom, then back to the top.*

3. Program the input selection command "A" from the RGB 2 input selection button on the projector's remote control into memory block #2 of the MLC 52's PC button as follows:
   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.

b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 2 button on the projector's remote control. The MLC has learned command "A" for RGB 2.

4. Program the input selection command "B" from the RGB 1 input selection button on the projector's remote control into memory block #3 of the MLC 52's PC button as follows:

a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the third LED from the bottom flashes.

b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 1 button on the projector's remote control. The MLC has learned command "B" for RGB 1.

5. Program the input selection command "B" from the RGB 2 input selection button on the projector's hand-held remote control into memory block #4 of the MLC 52's PC button as follows:

a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the fourth LED from the bottom flashes.

b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB 2 button on the projector's remote control. The MLC has learned command "B" for RGB 2.

6. If finished programming the MLC 52 buttons, return configuration DIP switch #1 to its Off (down) position, and test the system.

If you want to program video input selection at this time, proceed to "Programming video inputs — projector remote control type A," below.

Programming video inputs — projector remote control type A

1. Place the rear panel configuration DIP switch #1 in the On (up) position to enter learning mode. (If the MLC is already in learning mode, proceed to step **2**.)

2. Using IR learning, program command "A" from the Video input selection button on the projector's remote control into memory block #1 of the MLC 52's Video button as follows:

a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED flashes.

b. Within 5 seconds (while the Video button on the MLC 52 is blinking), press the Video button on the projector's remote control. The MLC has learned command "A" for video.

NOTE *When a command has been successfully learned, the IR learning LEDs on the MLC rear panel flash in rapid progression from the top to the bottom, then back to the top.*

3. Program the input selection command "A" from the S-video input selection button on the projector's remote control into memory block #2 of the MLC 52's Video button as follows:

a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.

b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the S-video button on the projector's remote control. The MLC has learned command "A" for S-video.

4. Program the input selection command "B" from the Video input selection button on the projector's remote control into memory block #3 of the MLC 52's Video button as follows:

a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the third LED from the bottom flashes.

b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the Video button on the projector's remote control. The MLC has learned command "B" for Video.

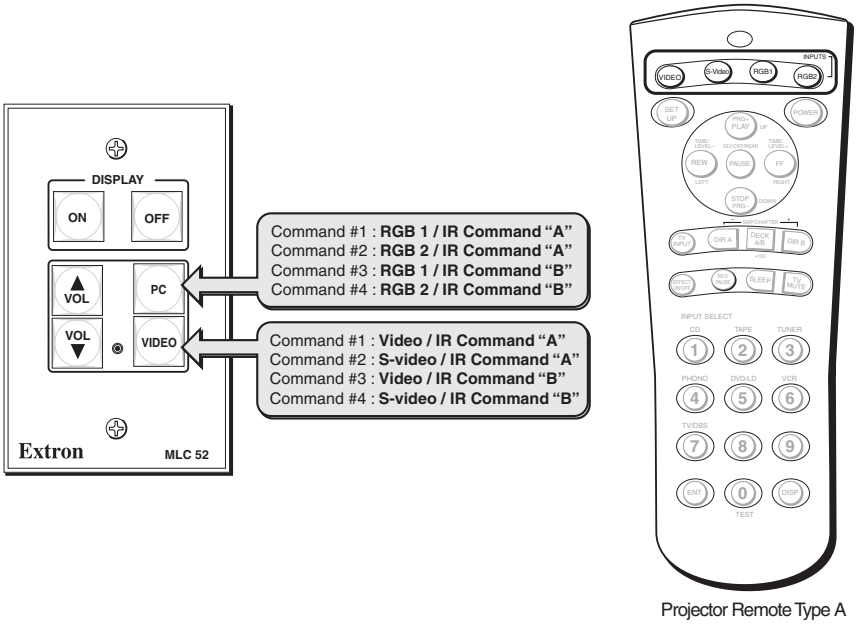
5. Program the input selection command "B" from the S-video input selection button on the projector's hand-held remote control into memory block #4 of the MLC 52's Video button as follows:

a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the fourth LED from the bottom flashes.

b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the S-video button on the projector's remote control. The MLC has learned command "B" for S-video.

6. When finished programming the MLC 52's buttons, return configuration switch #1 to its Off (down) position.

7. Test the system.



Programming MLC 52 input selection buttons from a projector remote control type A

Issuing input selection commands learned from a type A remote control

The MLC now has **four** commands each on the PC and Video buttons. When you press an MLC input button repeatedly, the following occurs:

Using the PC button (RGB):

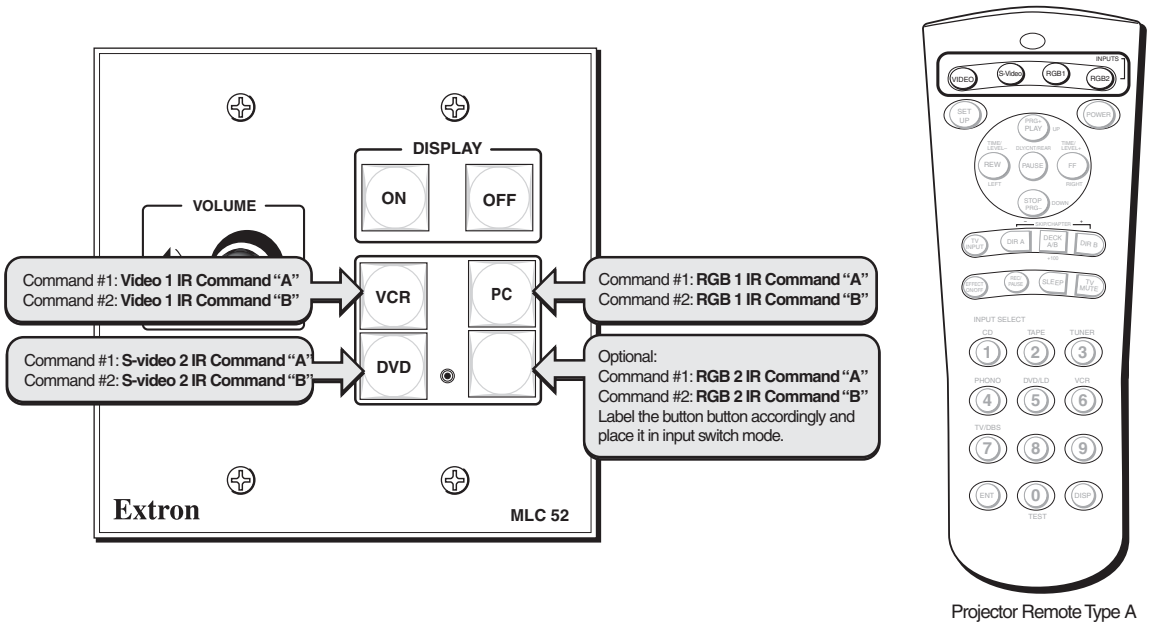
- **First press (memory block #1):** The MLC 52 issues command "A" for RGB 1 input selection. The projector switches to its RGB 1 input.
- **Second press (memory block #2):** The MLC 52 issues command "A" for RGB 2 input selection. The projector switches to its RGB 2 input.
- **Third press (memory block #3):** The MLC 52 issues command "B" for RGB 1 input selection. The projector switches to its RGB 1 input.
- **Fourth press (memory block #4):** The MLC 52 issues command "B" for RGB 2 input selection. The projector switches to its RGB 2 input.

Using the Video button (S-video or composite video):

- **First press (memory block #1):** The MLC 52 issues command "A" for composite video input selection. The projector switches to its video input.
- **Second press (memory block #2):** The MLC 52 issues command "A" for S-video input selection. The projector switches to its S-video input.
- **First press (memory block #1):** The MLC 52 issues command "B" for composite video input selection. The projector switches to its video input.
- **Second press (memory block #2):** The MLC 52 issues command "B" for S-video input selection. The projector switches to its S-video input.

Programming VC models — projector remote control type A

If you are using an MLC 52 IR VC or an MLC 52 RS VC with a type A remote control, program the buttons as indicated in the illustration below.



Programming an MLC 52 VC model with a projector remote control type A

Projector remote control type B (application 3)

This remote control has only two input buttons — one for the RGB inputs and one for the S-video and composite video inputs. Each of these buttons contains two commands (commands "A" and "B") that cause the button to toggle between inputs.

Following these steps, use IR learning to program the input selection commands from the projector's type B hand-held remote control onto the MLC's PC and Video or blank (VC models) buttons.

Programming RGB inputs — projector remote control type B

1. Place the rear panel configuration DIP switch #1 in the On (up) position to enter learning mode.

2. Using IR learning, program command "A" from the RGB input selection button on the projector's remote control into memory block #1 of the MLC 52's PC button as follows:

   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED flashes.

   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB button on the projector's remote control. The MLC has learned command "A" for RGB.

NOTE *When a command has been successfully learned, the IR learning LEDs on the MLC rear panel flash in rapid progression from the top to the bottom, then back to the top.*

3. Program the input selection command "B" from the RGB input selection button on the projector's remote control into memory block #2 of the MLC 52's PC button as follows:

   a. Press the PC button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.

   b. Within 5 seconds (while the PC button on the MLC 52 is blinking), press the RGB button on the projector's remote control. The MLC has learned command "B" for RGB.

4. If finished programming the MLC 52 buttons, return configuration DIP switch #1 to its Off (down) position, and test the system.

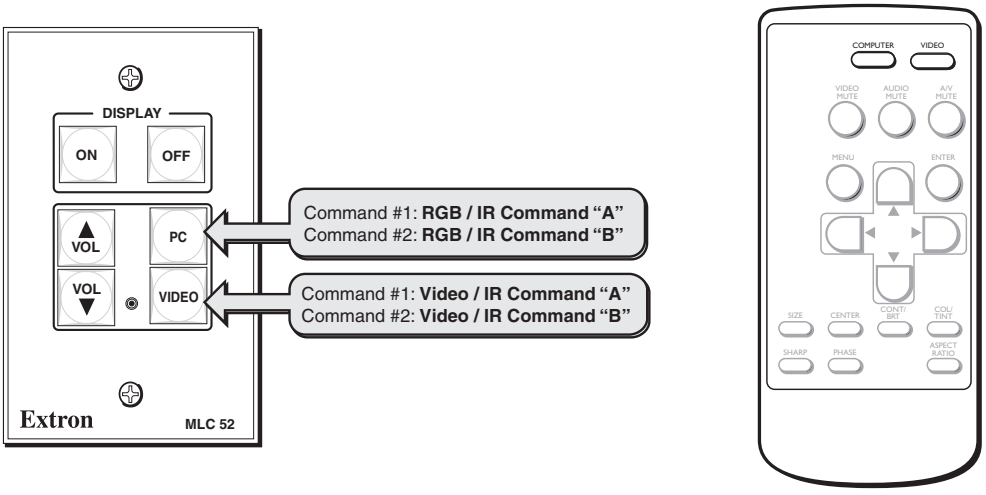
   If you want to program video input selection at this time, proceed to "Programming video inputs — type B remote control," on the next page.

Programming video inputs — projector remote control type B

1. Place the rear panel configuration DIP switch #1 in the On (up) position to enable learning mode. (If the MLC is already in learning mode, proceed to step **2**.)
2. Using IR learning, program command "A" from the Video input selection button on the projector's remote control into memory block #1 of the MLC 52's Video or blank (for VC models) button as follows:
   a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the bottom IR learning LED flashes.
   b. Within 5 seconds (while the Video button on the MLC 52 is blinking), press the Video button on the projector's remote control. The MLC has learned command "A" for Video.

NOTE *When a command has been successfully learned, the IR learning LEDs on the MLC rear panel flash in rapid progression from the top to the bottom, then back to the top.*

3. Program the input selection command "B" from the Video input selection button on the projector's remote control into memory block #2 of the MLC 52's Video button as follows:
   a. Press the Video button on the MLC front panel. The button blinks, indicating that the MLC is ready to learn the command. On the rear panel, the second LED from the bottom flashes.
   b. Within 5 seconds (while the Video or blank button on the MLC 52 is blinking), press the Video button on the projector's remote control. The MLC has learned command "B" for Video.
4. When finished programming the MLC 52 buttons, return configuration DIP switch #1 to its Off (down) position.
5. Test the system.



Programming MLC 52 input selection buttons from a projector remote control type B

Issuing input selection commands learned from remote control type B

The MLC now has **two** commands each on the PC and Video buttons. When you press an MLC input button repeatedly, the following commands are issued:

Using the PC button (RGB):

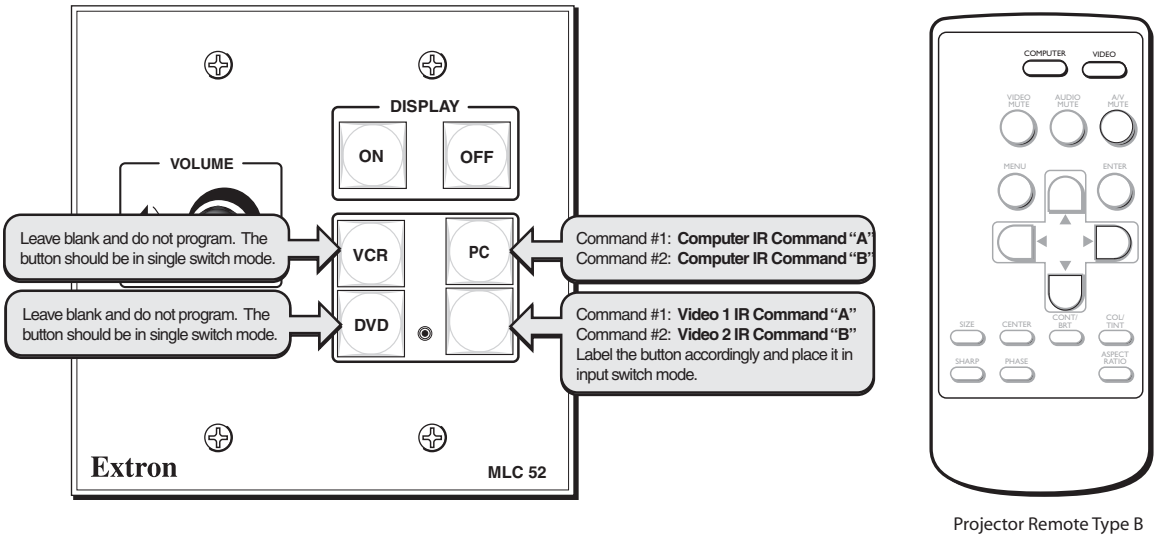
- **First press (memory block #1):** The MLC 52 issues command "A" for RGB input selection.
- **Second press (memory block #2):** The MLC 52 issues command "B" for RGB input selection.

Using the VIDEO button (S-video or composite video):

- **First press** (**memory block #1**): The MLC 52 issues command "A" for composite video input selection.
- **Second press** (**memory block #2**): The MLC 52 issues command "B" for S-video input selection.

Programming VC models — Projector remote control type B

If you are using a type B remote control with an MLC 52 IR VC or an MLC 52 RS VC, configure the buttons according to the diagram below.


DISPLAY
ON
OFF
VOLUME
VCR
PC
DVD
Leave blank and do not program. The button should be in single switch mode.
Leave blank and do not program. The button should be in single switch mode.
Command #1: Computer IR Command "A"
Command #2: Computer IR Command "B"
Command #1: Video 1 IR Command "A"
Command #2: Video 2 IR Command "B"
Label the button accordingly and place it in input switch mode.
Extron
MLC 52
COMPUTER
VIDEO
Projector Remote Type B

Programming an MLC 52 VC model with a projector remote control type B

Chapter Five

Serial Communication

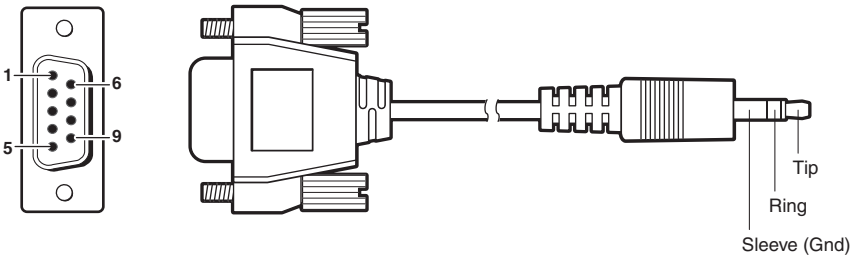
Using the MLC 52 Configuration Program

Using Simple Instruction Set (SIS™) Commands

Serial Communication

The MLC 52 can be remotely configured via a host computer connected to the front panel configuration port. Through this port, you can program the MLC's buttons with commands by using the Windows®-based configuration software (MLC 52/DVCM 50 Configuration Program). You can also issue certain SIS™ (Simple Instruction Set) commands through this port. The optional 9-pin D to 2.5 mm stereo mini TRS RS-232 configuration cable (part **#70-335-01**) can be used for this connection.

The connector has the following pin assignments:



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

RS-232 configuration cable pin assignments

The MLC 52 uses the following protocol:

9600 baud
8 bits
1 stop bit
Parity: none
Flow control: none

Using the MLC 52 Configuration Program

To perform advanced configuration tasks (e.g., setting button modes, updating firmware, adding display device drivers), you must use the included Extron Windows-based configuration software. Many items in the MLC 52 Configuration program are also accessible via front panel controls described in chapter 3, "Operation." Refer to that chapter for details on features and settings. Some features are available only via this configuration program. The MediaLink Help Program provides information on settings and on how to use the configuration program itself.

To install and run the MLC 52 configuration software, ensure that your PC meets the following system requirements:

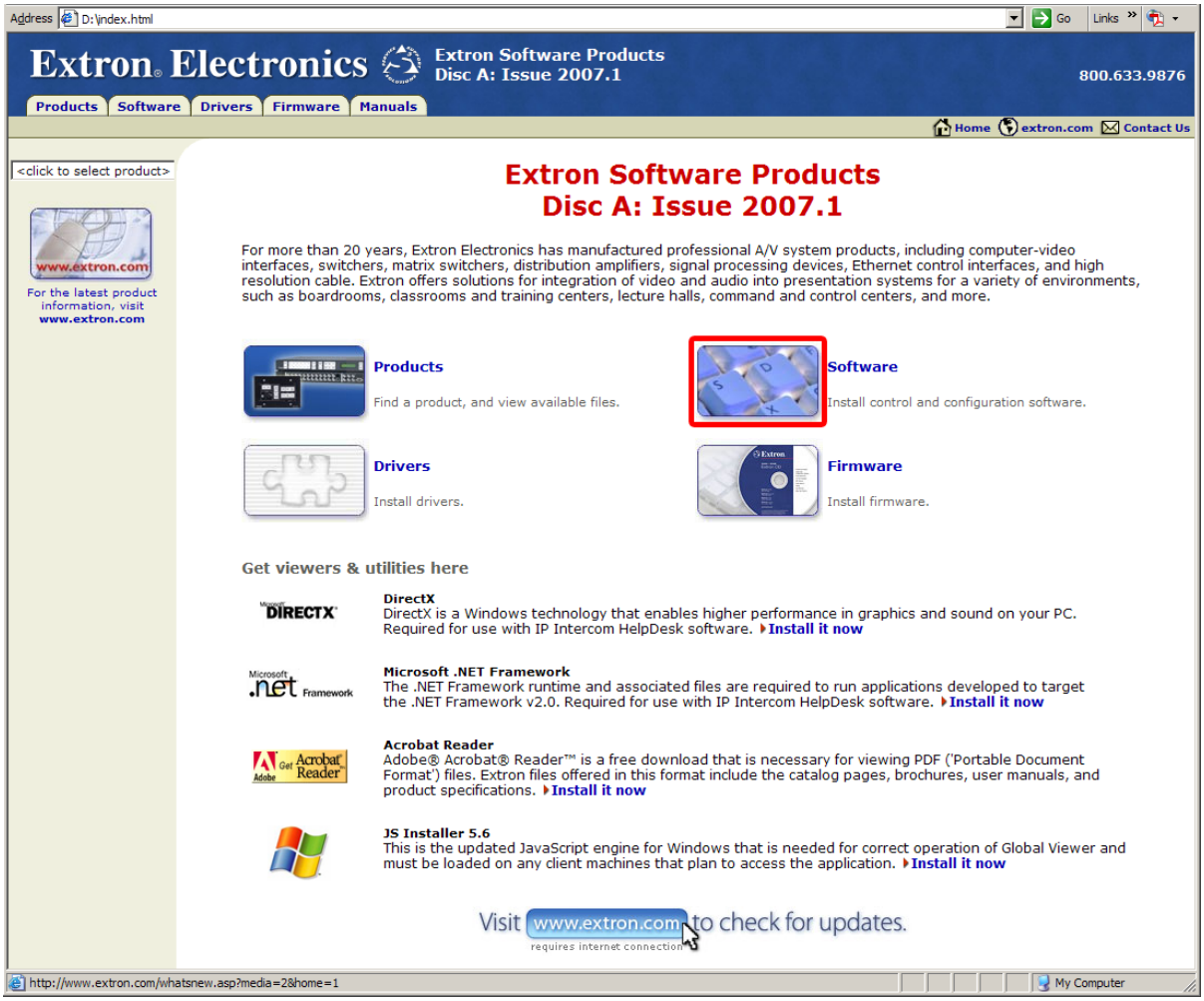
- Microsoft® Windows 2000 or later
- Pentium III or better processor (or compatible)
- 32 MB free hard disk space
- Microsoft® Internet Explorer© 4.0 or above
- 4x or higher CD-ROM player
- Minimum 1024 x 768 screen resolution

Extron's Windows-based configuration software is provided on a CD, which is packaged with the MLC. The program can also be downloaded from the Extron Web site (http://www.extron.com). Install this software on your computer.

Installing the software

To install the MLC 52 configuration software on your computer,

1. Insert the CD ROM Disk **A** into your CD drive and open it.
   - If the CD Autorun function is enabled on your PC, the disk starts automatically.
   - If Autorun is not enabled,
     a. From your Windows desktop, select **My Computer**.
     b. Open the CD-ROM drive.
     c. Double-click on the Launch icon (Launch.exe) to start the CD.
2. On the Extron Software Products Disk A screen, click the **Software** button (surrounded by a box in the illustration below).


Address D:\index.html
Go
Links
Extron Electronics
Extron Software Products
Disc A: Issue 2007.1
800.633.9876
Products
Software
Drivers
Firmware
Manuals
Home
extron.com
Contact Us
<click to select product>
www.extron.com
For the latest product information, visit www.extron.com
Extron Software Products
Disc A: Issue 2007.1
For more than 20 years, Extron Electronics has manufactured professional A/V system products, including computer-video interfaces, switchers, matrix switchers, distribution amplifiers, signal processing devices, Ethernet control interfaces, and high resolution cable. Extron offers solutions for integration of video and audio into presentation systems for a variety of environments, such as boardrooms, classrooms and training centers, lecture halls, command and control centers, and more.
Products
Find a product, and view available files.
Software
Install control and configuration software.
Drivers
Install drivers.
Firmware
Install firmware.
Get viewers & utilities here
DirectX
DirectX is a Windows technology that enables higher performance in graphics and sound on your PC. Required for use with IP Intercom HelpDesk software. Install it now
Microsoft .NET Framework
The .NET Framework runtime and associated files are required to run applications developed to target the .NET Framework v2.0. Required for use with IP Intercom HelpDesk software. Install it now
Acrobat Reader
Adobe® Acrobat® Reader™ is a free download that is necessary for viewing PDF ('Portable Document Format') files. Extron files offered in this format include the catalog pages, brochures, user manuals, and product specifications. Install it now
JS Installer 5.6
This is the updated JavaScript engine for Windows that is needed for correct operation of Global Viewer and must be loaded on any client machines that plan to access the application. Install it now
Visit www.extron.com to check for updates.
requires internet connection
http://www.extron.com/whatsnew.asp?media=2&home=1
My Computer

Extron Software Products Disc A screen

3. On the Control Software screen, click the **Install** link at the right of the MLC 52 Series line.
4. Follow the directions on the following windows to complete the software installation.

By default the installation creates a directory called "MediaLink" within the Extron folder on the PC hard drive, and places the following icons in it:

- MediaLnk52.exe (MediaLink Configuration program)
- MLC52wizard.exe (a program to help you get started with the MLC 52)
- MediaLnk52.hlp (MLC 52 Help)

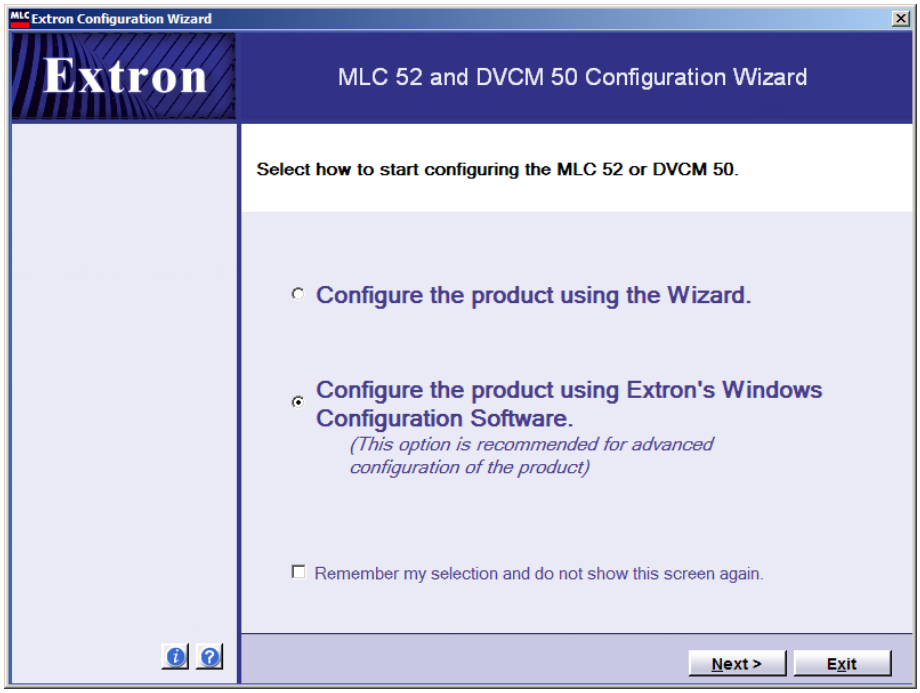
Starting the configuration program

NOTE *It is not necessary to have the MLC 52 connected and powered up in order to start the configuration program if you start it in emulation mode. See "Using emulation mode" on page 5-14, for more information.*

To run the configuration program,

1. Click **Start** on your PC screen.
2. From the Start menu, select **All Programs**.
3. From the Programs menu, select **Extron Electronics**.
4. From the Extron menu, select **MLC 52 + DVCM 50**.
5. Select **MLC 52 + DVCM 50 Control Program**. The first time you open the program, the MLC 52 and DVCM 50 Configuration Wizard screen opens, allowing you to choose either the Configuration Wizard or the Windows-based configuration program to configure your MLC.

   (You can select a different opening program and screen later, if desired. See "Selecting the starting screen" on page 5-46.)


Extron Configuration Wizard
Extron
MLC 52 and DVCM 50 Configuration Wizard
Select how to start configuring the MLC 52 or DVCM 50.
Configure the product using the Wizard.
Configure the product using Extron's Windows Configuration Software.
(This option is recommended for advanced configuration of the product)
Remember my selection and do not show this screen again.
Next >
Exit

Configuration Wizard screen

Loading Extron drivers

Extron drivers are control files (libraries) of Extron-created projector or display commands that are specific to a particular display device. There are different sets of drivers for serial (RS-232) and for IR control.

Before you can use the configuration software to configure the MLC's buttons, the IR and/or serial driver packages must be loaded onto your computer. You must then load the appropriate driver for your display device to the MLC in order to configure the MLC to control the device.

NOTE *The MLC 52 is compatible with IP Link IR drivers found in the IPL Driver Package, version **6** or higher. (See "Viewing the IR driver package version" on page 5-7.)*

NOTE *Pre-configured control files (drivers) should be used whenever possible. If no driver is available for the display that you want to control, it is possible to create your own driver via IR learning (see "Configuring the MLC 52 Using IR," in chapter 3, "Operation"), or by entering the control command strings for your display device on the User Defined tab in the Button Operations section of the MLC 52 main screen (see "Assigning user-defined functions to buttons" on page 5-34). Command strings can be obtained from the projector or display manufacturer.*

CAUTION *Loading a new driver causes the MLC's existing configuration to be overwritten. If you know that you will want to use the previous configuration again, be sure to save it when the screen prompts you to do so.*

Loading the serial (RS-232) drivers

When you install your MLC 52 configuration software, the installation program loads the Extron serial drivers onto your computer at the following location, unless you specify otherwise:

c:\Program Files\Extron\MediaLink\Drivers

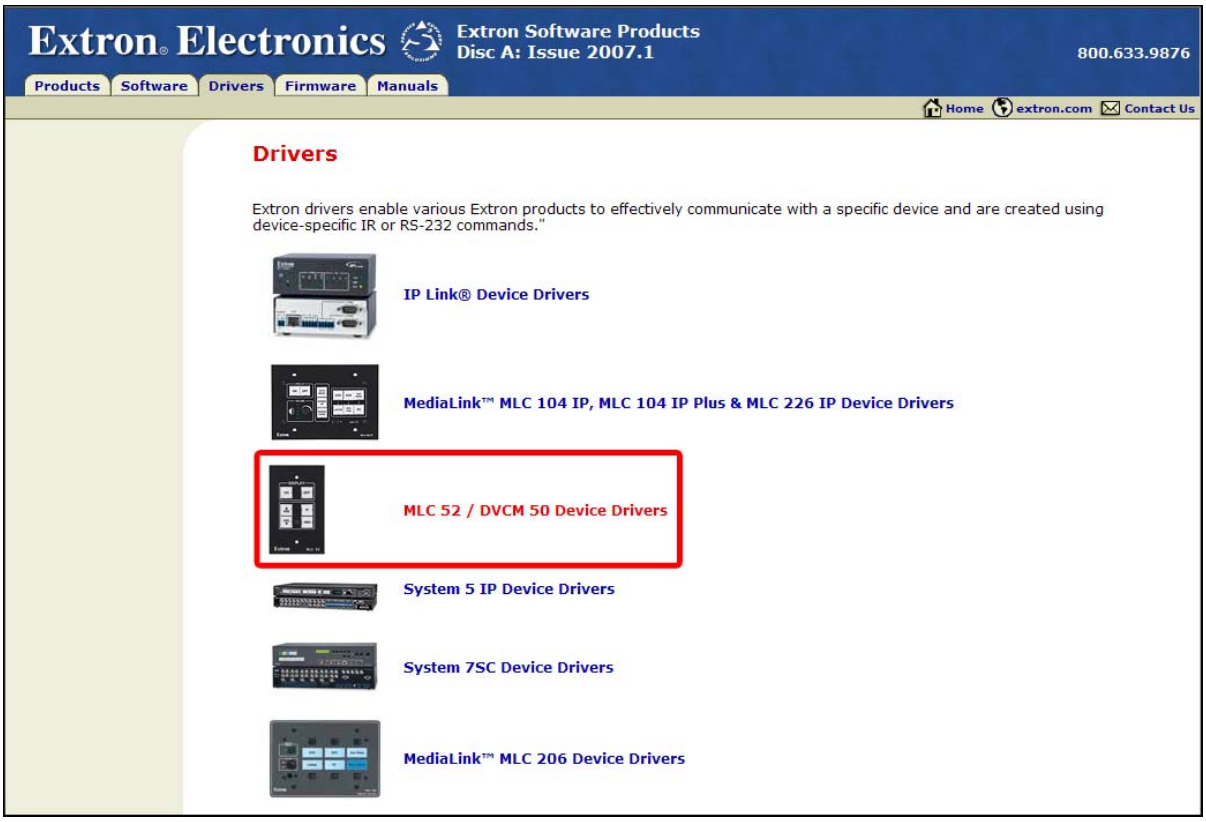
RS-232 drivers must be loaded/selected before you can choose RS-232 commands to program the buttons. (See "Adding a driver," later in this chapter.)

Loading the IR drivers

IR drivers are accessed and loaded separately from the MLC 52 configuration program. To load the IR drivers,

1. Load and open the Extron Software Products Disk A.
2. On the Extron Software Products Disk A screen, click the Drivers button, shown at right.

3. On the Drivers screen, select **MLC 52/DVCM 50 Device Drivers**.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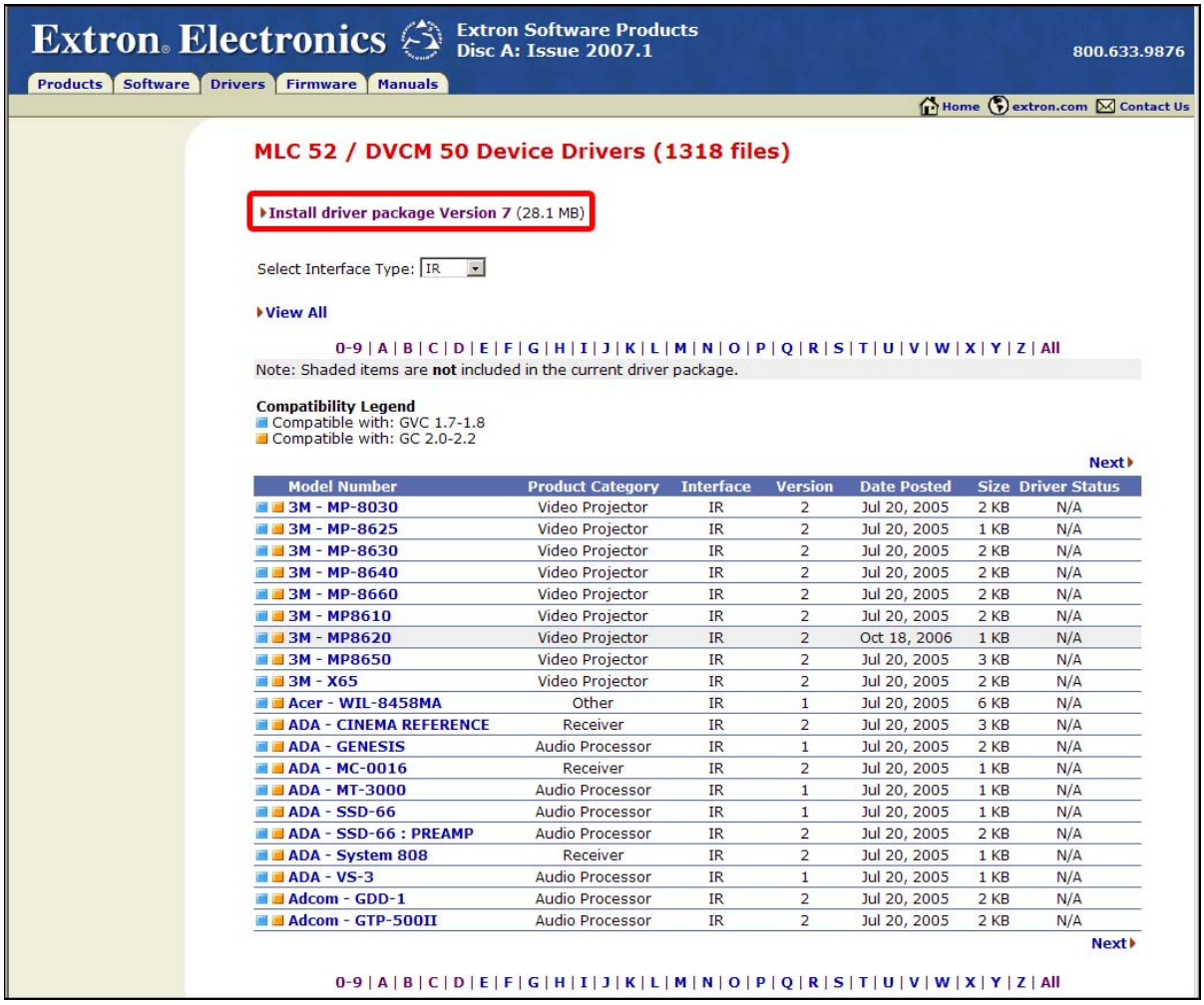
Drivers
Extron drivers enable various Extron products to effectively communicate with a specific device and are created using device-specific IR or RS-232 commands."
IP Link® Device Drivers
MediaLink™ MLC 104 IP, MLC 104 IP Plus & MLC 226 IP Device Drivers
MLC 52 / DVCM 50 Device Drivers
System 5 IP Device Drivers
System 7SC Device Drivers
MediaLink™ MLC 206 Device Drivers

Selecting the MLC 52 / DVCM 50 IR driver package

4. On the MLC 52/DVCM 50 Device Drivers screen,
   a. If desired, select IR from the Select Interface Type drop-down menu to view a list of all the IR drivers in the package.
   b. Click **Install Driver Package Version 7**.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MLC 52 / DVCM 50 Device Drivers (1318 files)
Install driver package Version 7 (28.1 MB)
Select Interface Type: IR
View All
0-9 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | All
Note: Shaded items are not included in the current driver package.
Compatibility Legend
Compatible with: GVC 1.7-1.8
Compatible with: GC 2.0-2.2
Next
Model Number | Product Category | Interface | Version | Date Posted | Size | Driver Status
3M - MP-8030 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
3M - MP-8625 | Video Projector | IR | 2 | Jul 20, 2005 | 1 KB | N/A
3M - MP-8630 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
3M - MP-8640 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
3M - MP-8660 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
3M - MP8610 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
3M - MP8620 | Video Projector | IR | 2 | Oct 18, 2006 | 1 KB | N/A
3M - MP8650 | Video Projector | IR | 2 | Jul 20, 2005 | 3 KB | N/A
3M - X65 | Video Projector | IR | 2 | Jul 20, 2005 | 2 KB | N/A
Acer - WIL-8458MA | Other | IR | 1 | Jul 20, 2005 | 6 KB | N/A
ADA - CINEMA REFERENCE | Receiver | IR | 2 | Jul 20, 2005 | 3 KB | N/A
ADA - GENESIS | Audio Processor | IR | 1 | Jul 20, 2005 | 2 KB | N/A
ADA - MC-0016 | Receiver | IR | 2 | Jul 20, 2005 | 1 KB | N/A
ADA - MT-3000 | Audio Processor | IR | 1 | Jul 20, 2005 | 1 KB | N/A
ADA - SSD-66 | Audio Processor | IR | 1 | Jul 20, 2005 | 1 KB | N/A
ADA - SSD-66 : PREAMP | Audio Processor | IR | 2 | Jul 20, 2005 | 2 KB | N/A
ADA - System 808 | Receiver | IR | 2 | Jul 20, 2005 | 1 KB | N/A
ADA - VS-3 | Audio Processor | IR | 1 | Jul 20, 2005 | 1 KB | N/A
Adcom - GDD-1 | Audio Processor | IR | 2 | Jul 20, 2005 | 2 KB | N/A
Adcom - GTP-500II | Audio Processor | IR | 2 | Jul 20, 2005 | 2 KB | N/A
Next
0-9 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | All

IR driver package list

5. Click **Run** on the next two download screens that appear, to start the Driver Installer.

6. Follow the instructions on the Install Wizard screens to load the IR drivers to your computer. Unless you specify otherwise, the IR drivers are placed at the following location:

   c:\Program Files\Extron\Driver2

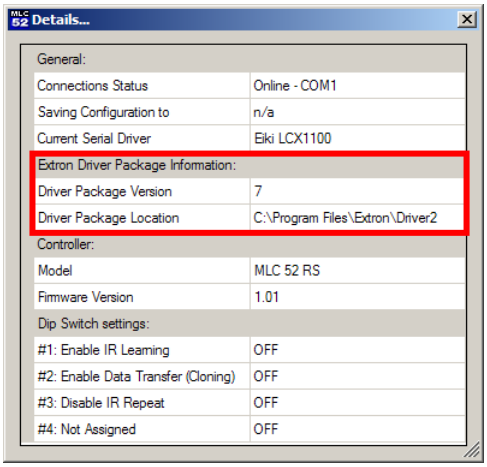
For information on loading an RS-232 or IR driver to the MLC 52, see "Adding a driver" on page 5-30.

Viewing the IR driver package version

To find out the version number of the IP Link IR driver package that you have,

1. Open the MLC 52 configuration program.

2. From the Help menu, select **Details...** . The Extron Driver Package Information section shows the driver package version number and the location of the IR drivers on your computer.

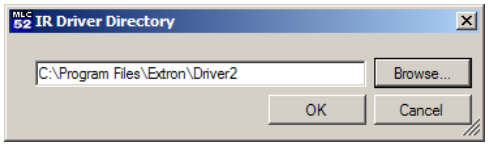


IR driver information in the Help > Details window

Changing the location of the IR drivers

When you load the IR driver package from the CD, these drivers are by default placed at **c:\Program Files\Extron\Driver2**. If you store your IR drivers in a different folder, you must direct the MLC to this new folder to obtain IR drivers when you want to load them.

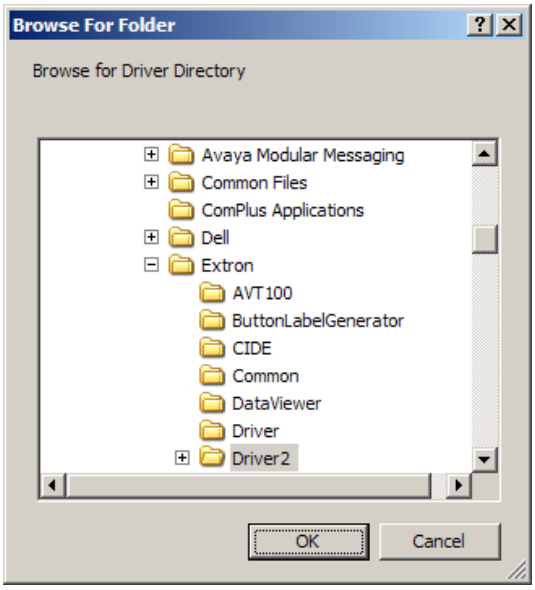
1. If desired, create a new folder on your computer hard drive for the IR drivers.
2. Move the IR driver files to their new location.
3. From the Tools menu, select **Change IR Driver Location**. The IR Driver Directory window opens.



IR Driver Directory window

4. If you know the path to the new IR driver location, type it in the text box.

   If you do not know the path, click **Browse**. Use the Browse For Folder window to locate the folder where the IR drivers have been stored, then click the **OK** button on the browse window. The path is displayed in the text field on the IR Driver Directory window.



Browse For Folder window

5. Click **OK** on the IR Driver Directory.

Key to file names

File name	Description
_____.MLL	Extron-supplied display device driver library files. These files contain commands and settings pertinent to a particular projector or display.
_____.MLK	User-saved MLC/MLC-MLS/MLS configuration files. This includes adjustments/settings and whatever driver (if any) was installed in the MLC at the time the file was saved.
_____.EIR	IP Link IR drivers (which can also be used by the MLCs)

Configuring using the MLC 52 Configuration Wizard

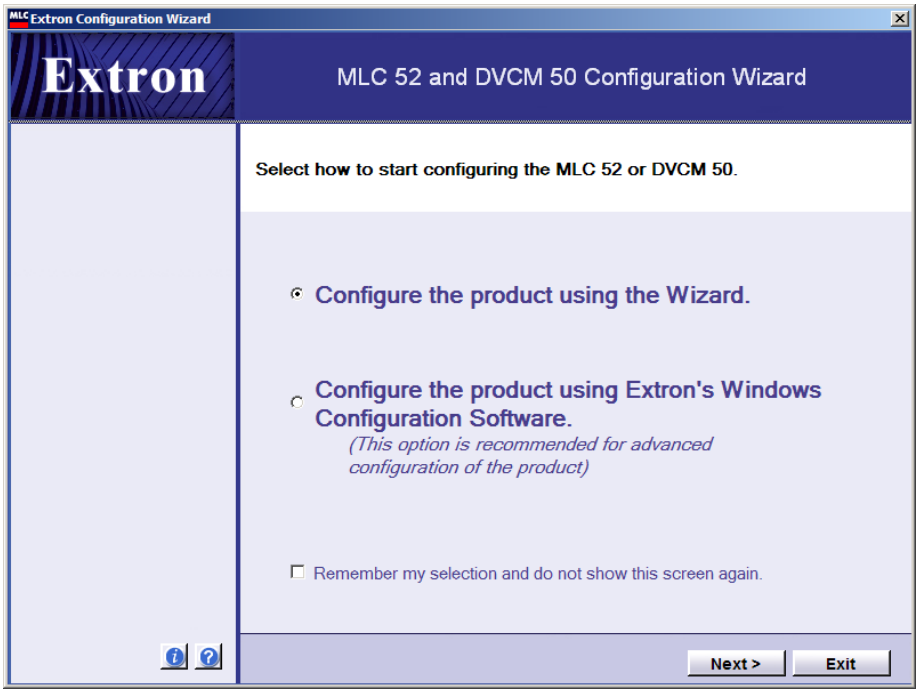
The MLC 52 Configuration Wizard is a program that helps you perform basic configuration of the MLC 52. You can use the wizard to create a new configuration or to open and upload an existing one that you can then edit using the Windows-based configuration software. You can configure an MLC that is connected to your PC, or you can configure an MLC 52 (or a DVCM 50) that is not connected (by using emulation mode). For information on performing a complete configuration of your MLC, see "Configuring using the Windows-based configuration program" on page 5-19.

NOTE *If you have an RS model of the MLC 52 or the MLC 52 VC, the wizard allows you to configure the MLC with a serial driver only. If you want to create a configuration with additional IR drivers, you must access the Windows-based configuration software directly.*

If your MLC is an IR model, the wizard lets you load only an IR driver.

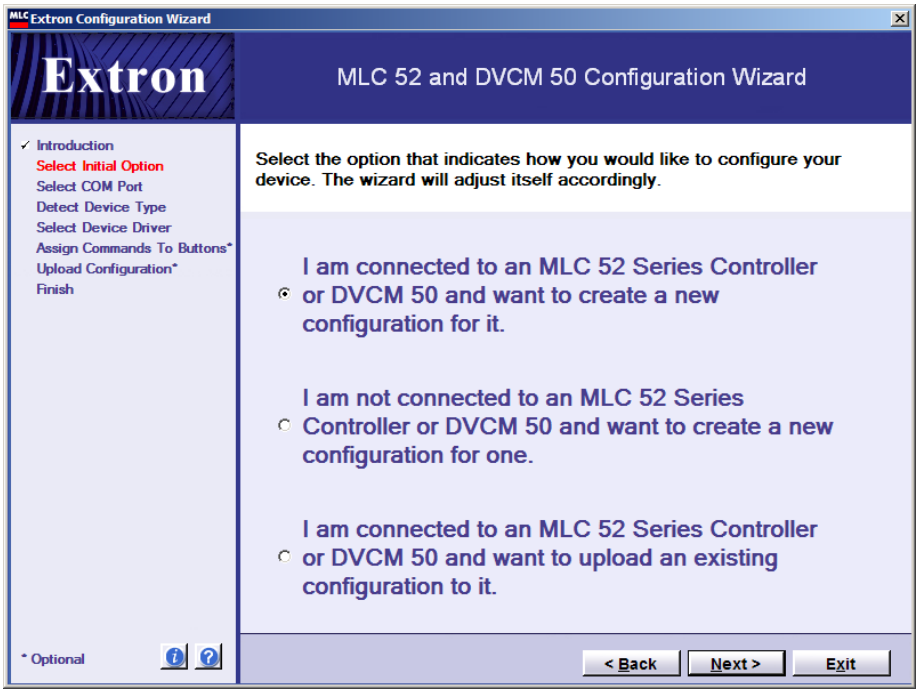
To configure the MLC using the Configuration Wizard,

1. On the first Configuration Wizard screen, select the "Configure the product using the Wizard" radio button, and click **Next**.


Extron Configuration Wizard
Extron
MLC 52 and DVCM 50 Configuration Wizard
Select how to start configuring the MLC 52 or DVCM 50.
Configure the product using the Wizard.
Configure the product using Extron's Windows Configuration Software.
(This option is recommended for advanced configuration of the product)
Remember my selection and do not show this screen again.
Next >
Exit

Initial configuration options screen

2. On the Welcome screen, click **Next** again. The following screen opens.


Extron Configuration Wizard
Extron
MLC 52 and DVCM 50 Configuration Wizard
✓ Introduction
Select Initial Option
Select COM Port
Detect Device Type
Select Device Driver
Assign Commands To Buttons*
Upload Configuration*
Finish
Select the option that indicates how you would like to configure your device. The wizard will adjust itself accordingly.
I am connected to an MLC 52 Series Controller or DVCM 50 and want to create a new configuration for it.
I am not connected to an MLC 52 Series Controller or DVCM 50 and want to create a new configuration for one.
I am connected to an MLC 52 Series Controller or DVCM 50 and want to upload an existing configuration to it.
* Optional
< Back
Next >
Exit

Select Initial Option screen, first radio button selected

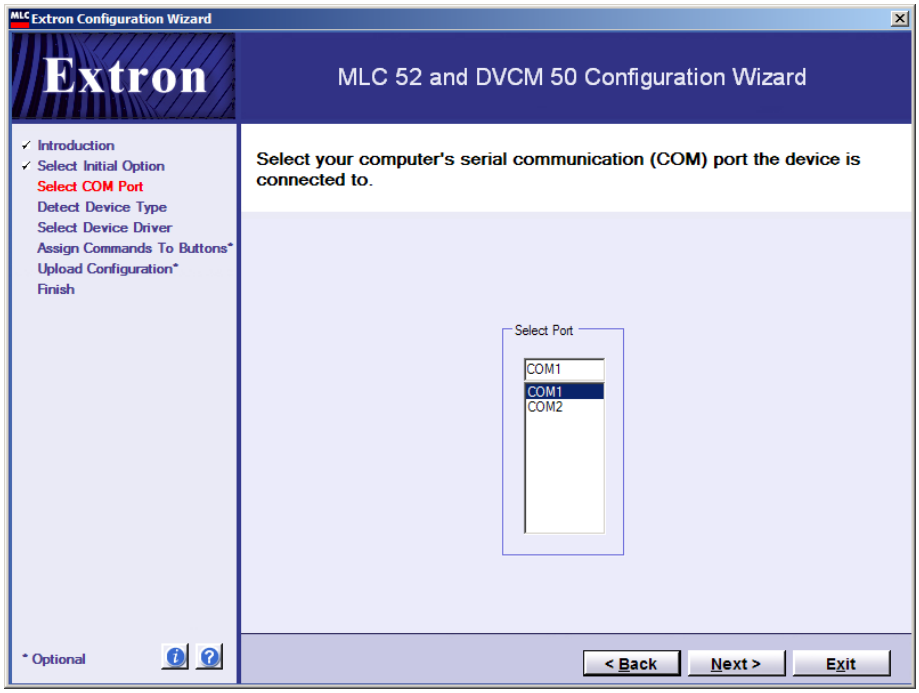
3. On the Select Initial Option screen, select the radio button for the type of connection you want to make between the MLC and your computer:
   - Select the first radio button if your MLC is connected to your computer and you want to create a new configuration.
   - Select the second radio button if you want to create a configuration, but the MLC is not currently connected to your computer. When you select this option, you create the configuration and save it on your computer, to be uploaded to an MLC later (emulation mode). For information on configuring in emulation mode, see "Using emulation mode," later in this chapter.
   - Select the third radio button if the MLC is connected to your computer, and you want to use a configuration that you have already created and saved.
4. Continue through the wizard program, following the instructions on the screens for either of the processes described in the following sections:
   - "Creating a new configuration using the wizard"
   - "Uploading an existing configuration using the wizard"

   As you progress through the screens, note that the left side bar lists the screens that you have seen, with the name of the current screen in red.
5. When you reach the last wizard screen in the process you are following, you can select to either edit the configuration you just completed or exit the wizard. After selecting the desired radio button, click **Finish**.
   - If you select to edit the new configuration, a message appears, reminding you to save the edits you are about to make to the configuration file. Click **OK**. The MLC 52 Configuration Program screen opens. See "Saving and restoring a configuration" on page 5-23 for information on saving the configuration when you are finished editing it.
   - If you select to exit the wizard, the wizard program closes.

Creating a new configuration using the wizard

To create a new configuration for the connected MLC using the Configuration Wizard,

1. On the Select Initial Option screen, select the first radio button, then click **Next**.
2. On the Select Com Port screen, select the serial communication port through which the MLC is connected to your computer, then click **Next**. (Your system administrator should be able to provide your communications port information.

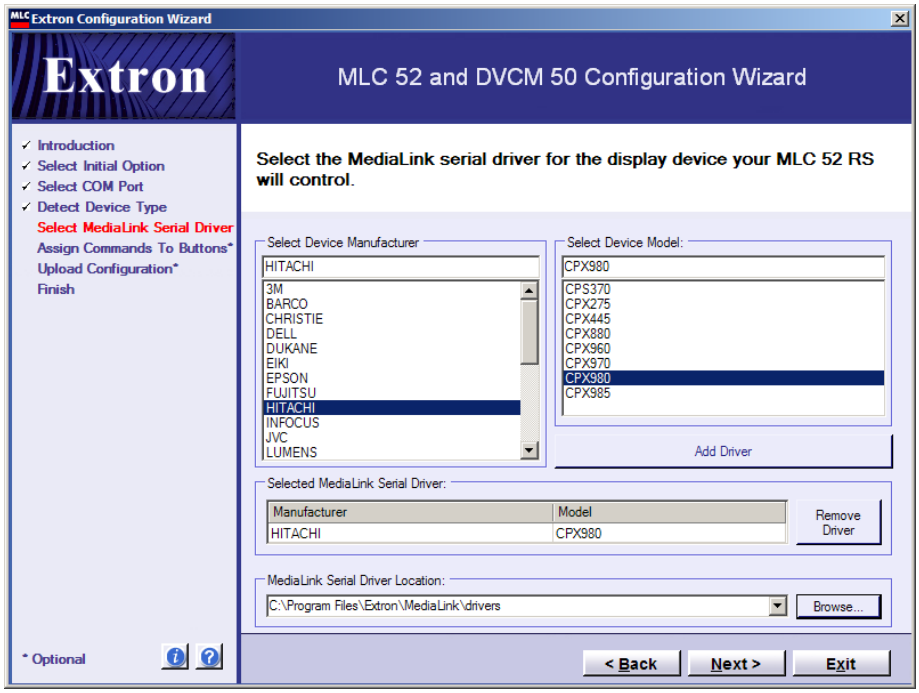


Select COM Port screen

3. The Detect Device Type screen appears, showing the name and a representation of the MLC 52 that is connected to your computer's serial port. Click **Next** to continue.

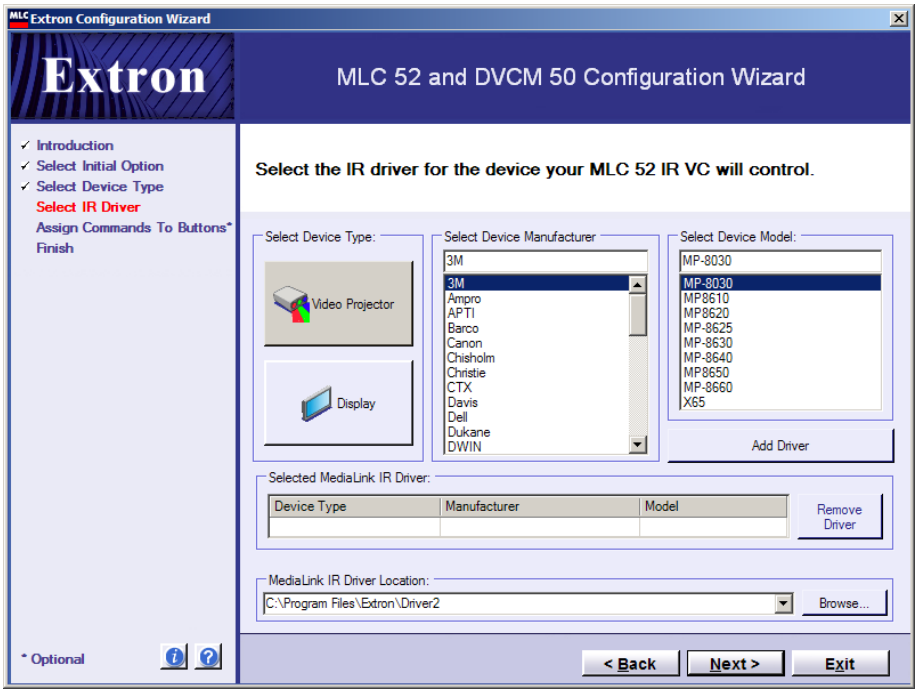
4. Depending on whether you have an RS or an IR model, one of the following driver selection screens appears.

   - **For MLC 52 RS and MLC 52 RS VC:**



Select MediaLink Serial Driver screen for RS models

- **For MLC 52 IR and MLC 52 IR VC:**



Select IR Driver screen for IR models

On the driver selection screen, select a device driver for your MLC as follows:

a. **IR models only:** Click the **Video Projector** or **Display** button to specify the type of device you have.

b. From the list in the Select Device Manufacturer field, select the manufacturer name for the projector or display for which you are configuring the MLC.

c. In the Select Device Model field, select the model name of the display device.

NOTE *If no manufacturer or device names appear in these fields, browse to locate the folder on your computer containing the serial or IR drivers, as follows:*

i. *Click the **Browse** button at the right of the MediaLink [Serial or IR] Driver Location field.*

ii. *In the Browse For Folder window, locate the folder containing the drivers. By default, this folder is placed at:*

***c: Program Files\Extron\MediaLink\Drivers** for serial drivers*

***c: Program Files\Extron\Driver2** for IR drivers*

iii. *Click on the folder, then click **OK**. The Browse For Folder window closes, and the path to the selected drivers folder is displayed in the Driver Location field. The Select Device Manufacturer and the Select Device Name fields are populated with the manufacturer and device names, respectively.*

d. Click the **Add Driver** button. The selected manufacturer and model names are displayed in the Selected MediaLink [Serial or IR] Driver field.

If you change your mind about the driver you selected, click **Remove Driver**, and repeat steps **4b** through **4d** to add a different driver.

e. Click **Next**. The Assign Commands To Buttons screen opens, displaying a diagram of the buttons on your MLC 52 and a list of commands that are available with the selected driver.

5. (Optional) On the Assign Commands To Buttons screen, you can assign up to four commands to any of the six MLC buttons reproduced in the diagram that **do not** already have commands assigned.

When the Assign Commands to Buttons screen opens via the wizard, some of the buttons may already be programmed with commands; for example, most drivers have power on and power off commands programmed on the two Display buttons, which are labeled On and Off on the wizard screen. On the standard MLC (not the VC model), many of the drivers also have commands programmed on the two Vol buttons to increase/decrease the display device's volume. Because commands have been added to these buttons, red triangles appear in their upper-left corners. You cannot remove these preprogrammed commands from the volume and power buttons or add commands to them using the wizard. (You can add commands to them using the configuration software directly. See "Configuring using the Windows-based configuration program" on page 5-19.)

Buttons that are labeled PC, Video, DVD, VCR, or blank are left unprogrammed. You can add, remove, or change commands on these buttons.

Alternatively, you can click **Skip** to go to the next screen, and complete the wizard without adding any commands at this time. (You can add commands later from the Windows-based configuration software.)

The buttons are prelabeled. You may wish to change these labels if they no longer reflect the commands you added to the buttons. To change the button labels, you must access the Windows-based configuration software directly. (See "Assigning functions to buttons" on page 5-23, for more information.)

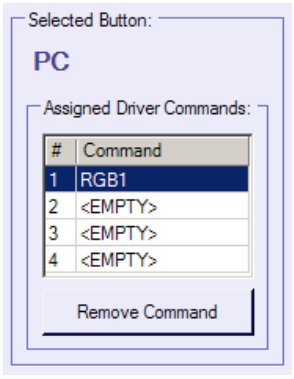
Assign Commands To Buttons window with PC button selected

To add a command to a button,

a. Click on the screen button that you want to program. A yellow box appears around it, and its name is displayed in the Selected Button field. In the illustration above, the button labeled "PC" was selected.

b. In the Select Driver Command field, click on the command function you want the selected button to execute. In the illustration, RGB1 was selected.

c. Click **Add Command**. The selected command appears in the next available slot in the Assigned Driver Commands field, replacing <EMPTY>. See the example at right.



d. If you want to add another command to the same button, repeat steps **5b** and **5c**. You can assign up to four commands to a button.

e. If you want to assign commands to another button, repeat steps **5a** through **5d** for each button that you want to program.

NOTE *If you do not want to add a command to a button at this time, click **Skip** to go to the next screen.*

To remove a command from a button,

a. Click on the button from which you want to remove the command.

b. In the Assigned Driver Commands field, click on the command function that you want to remove.

c. Click **Remove Command**. The command name is replaced by <EMPTY> in the Assigned Driver Commands field.

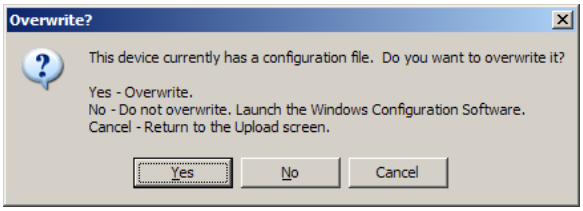
6. When finished programming buttons, click **Next**. The Upload Configuration screen is displayed.

7. Click the **Upload** button to begin the process of loading your new configuration to the MLC.

   a. A prompt appears, asking if you want to save the configuration to a file.

      - If you click **Yes**, a Save Configuration File window opens, on which you can enter a file name (it must have a .mlk extension) and browse to the folder in which you want to save the configuration file. (By default, this window opens to the **c: \Program Files\Extron\MediaLink** folder to save configurations.)
      - If you click **No**, the configuration is uploaded to the MLC, but it is not saved. If you overwrite it with a new configuration, it is lost.

   b. If your MLC already has a configuration loaded, the following prompt opens:


Overwrite?
This device currently has a configuration file. Do you want to overwrite it?
Yes - Overwrite.
No - Do not overwrite. Launch the Windows Configuration Software.
Cancel - Return to the Upload screen.
Yes
No
Cancel

Overwrite prompt

      - Click **Yes** if you want your new configuration to replace the existing one.
      - If you click **No**, the wizard closes without uploading the configuration. If you did not save the configuration when first prompted, another prompt appears, giving you another opportunity to save the new configuration to a file before the wizard closes.

   c. If you did not exit the wizard, the configuration you created is uploaded to the MLC. When the upload is finished, the screen displays the message "Upload Complete."

8. If you want to upload this configuration to another MLC, click Upload again. You are prompted to detach the RS-232 configuration cable from the currently connected MLC, and to attach the cable to the next MLC to which you want to upload the same configuration. After you have done this, click OK on the prompt window. The wizard uploads the configuration to the new MLC.

   If you do not want to upload the configuration to another MLC, skip to step **9**.

9. When finished uploading the configuration, click **Next**. The Finish screen is displayed.

10. On the Finish screen, select either of the radio buttons, then click **Finish**.

    - **The first radio button** closes the wizard and opens the Windows-based configuration software, enabling you to view and edit the configuration you most recently uploaded.

When you click **Finish** with this option selected, a prompt appears, reminding you to save the configuration after editing it using the Windows-based configuration software. Click **OK** to close the prompt. After a few seconds, the MLC 52 configuration program main screen opens, displaying your most recently uploaded configuration. (See "Configuring using the Windows-based configuration program" on page 5-19, for instructions on editing a configuration.)

- **The second radio button** closes the wizard without opening the configuration software.

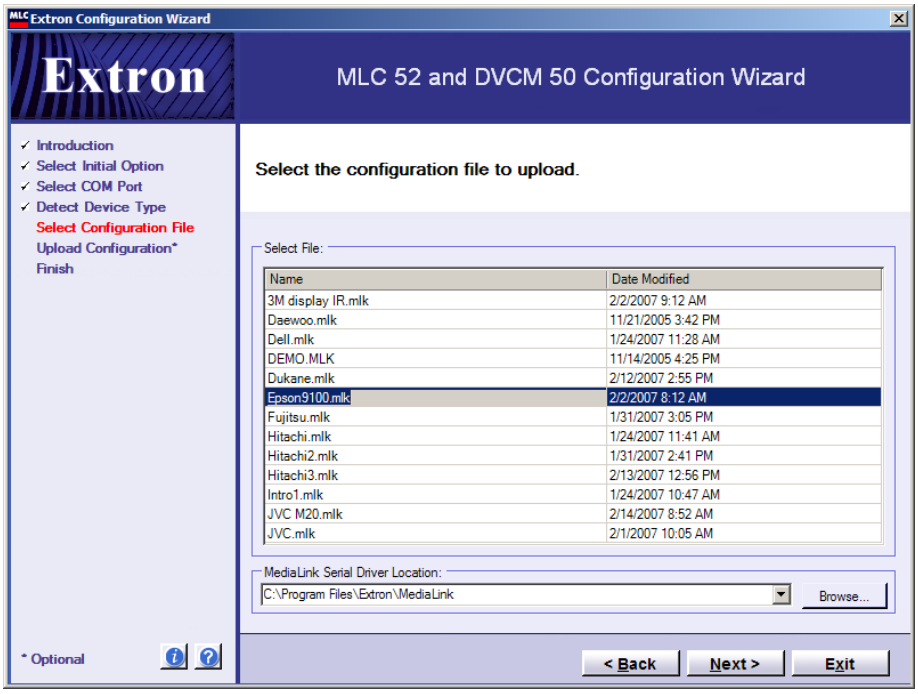
NOTE *If you have not yet saved your new configuration, both of these options also save it.*

Uploading an existing configuration using the wizard

As an alternative to creating a completely new configuration, you can use the wizard to open and upload an existing configuration. You can then use the Windows-based configuration software to edit the configuration and, if desired, save it under a new name.

To upload an existing configuration,

1. Open the wizard and click **Next** on the Introduction screen so that the Select Initial Option screen is displayed.
2. On the Initial Option screen, select the third radio button, called "**I am connected to an MLC 52 Series Controller or DVCM 50 and want to upload an existing configuration to it**," then click **Next**.
3. On the Select COM Port screen, select the serial communication port through which the MLC is connected to your computer, then click **Next**.
4. Click **Next** on the Detect Device Type screen.
5. In the Select File section of the Save Configuration File screen, click on the desired configuration file (with a .mlk extension).



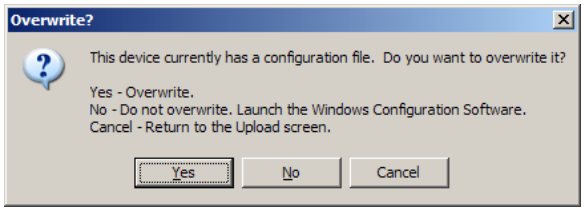
Select Configuration File screen (RS version)

NOTE *By default, the configuration files are stored at the following location: **c: Program Files\Extron\MediaLink**. This is where the configuration program looks for these files when you click **Next**. If the configuration file you want is stored elsewhere, click the **Browse** button, near the lower-right corner of the screen, and use the Browse For Folder screen to locate the file (it must have a .mlk extension). When you find the file, click on it, then click **OK**. The path to the selected configuration is displayed in the field at the bottom of the screen.*

6. Click **Next**.

7. On the Upload Configuration screen, click the **Upload** button to begin the process of loading your new configuration to the MLC.

   If your MLC already has a configuration loaded, the following prompt appears:


Overwrite?
This device currently has a configuration file. Do you want to overwrite it?
Yes - Overwrite.
No - Do not overwrite. Launch the Windows Configuration Software.
Cancel - Return to the Upload screen.
Yes
No
Cancel

Overwrite prompt

   - Click **Yes** if you want your new configuration to replace the existing one.
   - If you click **No**, another prompt is displayed, reminding you that you have elected to exit the wizard and start the Windows-based configuration software. It asks you if you want to save the configuration you just selected.
     - If you click **Yes**, a Save As... window opens. Save the configuration to the desired location.
     - If you click **No**, the wizard closes without uploading the configuration.

   If you did not exit the wizard, the configuration you created is uploaded to the MLC. When the upload is finished, the screen displays the message "Upload Complete."

8. If you want to upload this configuration to another MLC, click **Upload** again. You are prompted to detach the RS-232 cable from the currently connected MLC, and to attach the cable to the next MLC to which you want to upload the same configuration. After you have done this, click **OK** on the prompt window. The wizard uploads the configuration to the next MLC.

   If you do not want to upload the configuration to another MLC, skip to step **9**.

9. When finished uploading the configuration, click **Next**. The Finish screen is displayed.

Wizard Finish screen

10. On the Finish screen, select either of the radio buttons, then click **Finish**.

- **The first radio button** closes the wizard and opens the Windows-based configuration program, enabling you to view and/or edit the configuration you most recently uploaded.

  When you click Finish with this option selected, a prompt appears, reminding you to save the configuration after editing it using the Windows-based configuration software. Click **OK** to close the prompt. After a few seconds, the Windows-based configuration software main screen opens, displaying your most recently uploaded configuration. (See "Configuring using the Windows-based configuration program," in the next section, for instructions on editing a configuration.)

- **The second radio button** closes the wizard without opening the configuration software.

Configuring using the Windows-based configuration program

To configure the MLC 52 more extensively than the Configuration Wizard permits (for example, to add IR drivers to an MLC 52 RS, or to change button labels), you can work directly from the Windows-based configuration software main screen.

This screen is also your starting point for performing advanced configuration procedures that also are not available through the wizard (for example, configuring buttons on the optional IR 452 remote control to enable the IR 452 to control a VCR, DVD player, or other display device via the MLC and the IR Link or IRL 20. See "Programming the MLC 52 for control by the IR 452 Remote," later in this chapter).

Using the software, you can create a completely new configuration, or modify an existing configuration and save it under a new name.

This section discusses configuring an MLC that is connected to your computer. You can also create and save configurations in *emulation mode* for an MLC 52, an MLC 52 VC, or a DVCM 50 that is **not** connected to your computer. (For more information, see "Using emulation mode," later in this chapter.)

Overview of the configuration procedure

These are the main steps to configuring the MLC 52 using the MLC main screen. Details on each step are provided in the sections that follow this overview.

1. Open the MLC 52 Configuration Program main screen and select a communication port. (See "Opening the MLC 52 Configuration Program screen," in the next section.)
2. If your MLC already has a configuration loaded, save this configuration if desired. (If you do not save the current configuration, it is overwritten when you enter and upload the new settings.)
3. If you want to base your configuration on an existing one, restore the desired configuration. Follow steps 4 through 10 to make any desired changes to it. (See "Restoring a configuration" on page 5-24.)

   If you want to create a completely new configuration, proceed to step 4.
4. On the main screen, add one or more IR drivers and/or a serial driver for the projector or display that you plan to connect to the MLC 52. (See "Adding a driver" on page 5-30.)
5. (Optional) Click the **Learn IR Command** button to enable the MLC to learn one or more commands from the display device's remote control. (See "Performing IR learning via software" on page 5-40.)
6. For your selected drivers, add or change commands on the MLC and/or IR 452 buttons as desired. (See "Assigning functions to buttons" on page 5-32.)
7. As desired, edit the MLC and/or IR 452 button parameters available in the Button Settings section. (See "Button Settings section" on page 5-29.)
8. On the **Display Power Settings** tab, enter the display device's power on and off settings as desired.

   NOTE *The settings in steps 8 and 9 are usually auto-set when an RS-232 driver is loaded. If the driver does not contain these settings, you can enter them manually.*
9. On the **Display Comm Settings** tab, enter the appropriate baud rate, data bits, and parity settings for the display device's communications port.
10. Save the configuration. (See "Saving and restoring a configuration" on page 5-23.)

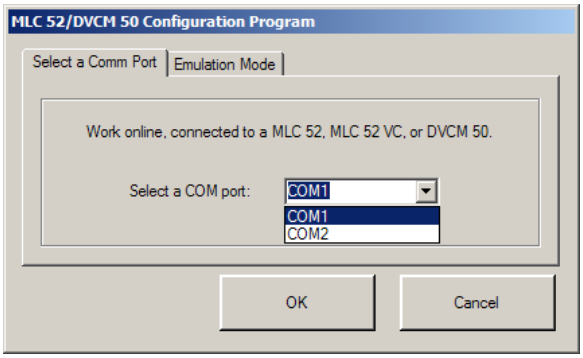
Opening the MLC 52 Configuration Program screen

To access the main screen (from outside the Configuration Wizard program),

1. From the Configuration Wizard screen, select the radio button called "**Configure the product using Extron's Windows Configuration Software**," and click **Next**. The mode selection window opens in front of the main screen.
2. On the mode selection window, select the **Select a Comm Port** tab (if it is not already displayed). Make sure that your MLC is connected to your computer and has power.

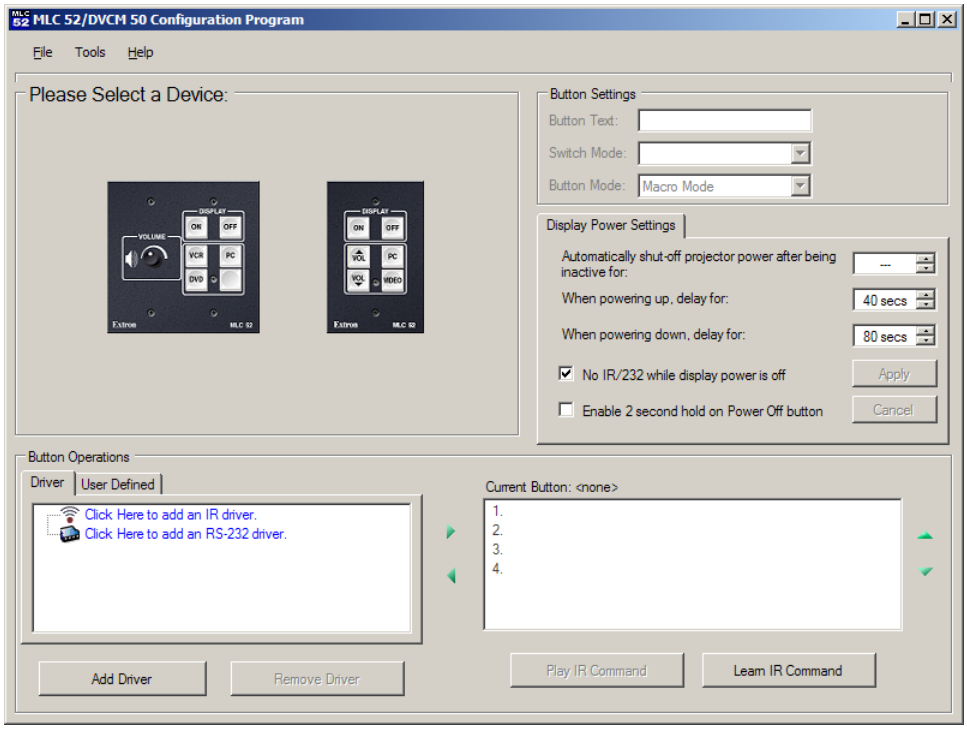
NOTE *If you want to create a configuration for an MLC that is **not** connected to your computer, select the **Emulation Mode** tab and see "Using emulation mode" on page 5-43.*

3. From the "Select a COM port" drop box, select the port through which your computer will communicate with the MLC (information on the communications port to use should be available from your system administrator).



Mode selection window, Select a Comm Port tab

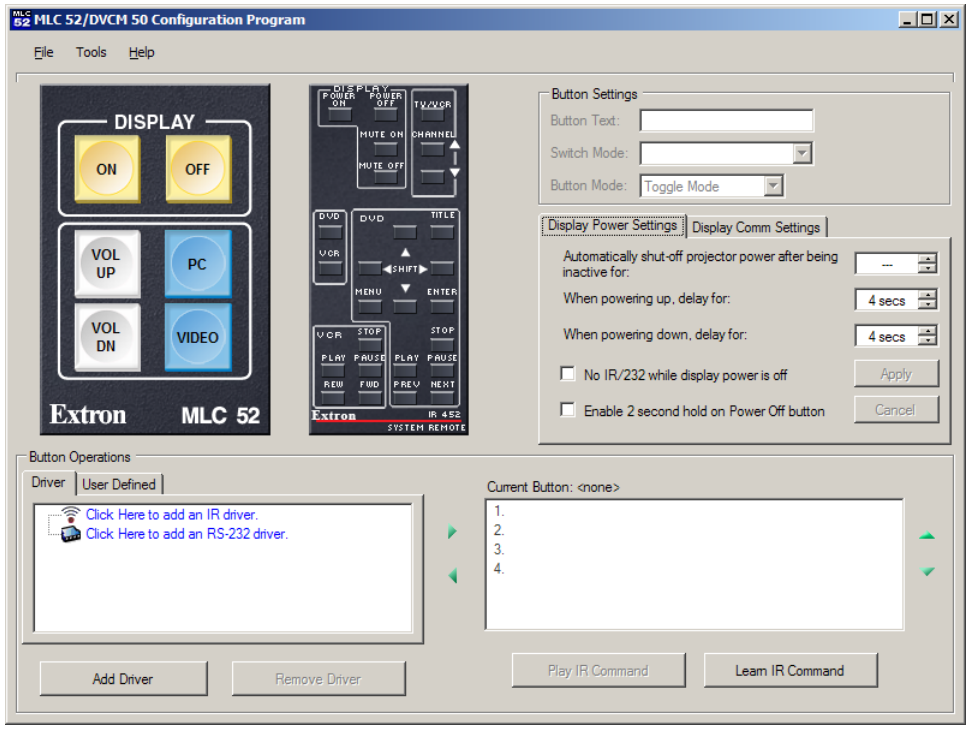
4. Click **OK**. The following screen appears:



Model selection screen

5. Click on the graphic representation of the connected MLC 52 model (standard or VC). (When you subsequently open the MLC 52 configuration program, the software detects and displays the model that you originally specified, and you do not see this screen again.)

After a few seconds, the Extron MLC 52 Configuration Program main screen appears, displaying a graphic representation of your selected model and of the IR 452 remote control.



The MLC 52 Configuration Program screen (not configured)

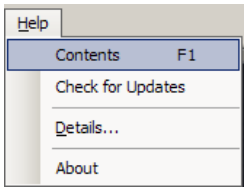
NOTE *If you have loaded any configurations to your MLC previously, the most recently saved configuration is displayed, including button switch mode colors and name labels, driver commands, and display device settings.*

NOTE *The color of each button on the screen reflects the button's switch mode. If you open the configuration software through the wizard, the buttons' switch modes are set according to the configuration you just created via the wizard. If you open the software without going through the wizard, and no configuration has been loaded to the MLC, the screen buttons are the factory defaults colors (See "Factory defaults" on page 5-37).*

6. Create a configuration for your MLC as described in the following sections.

   - If you want to base the new configuration on an existing one, **restore** the desired configuration. (See "Restoring a configuration," later in this chapter.) You can then modify it as desired and save it under a new name, as discussed in the following sections.
   - If you want to create a completely new configuration, and a configuration has already been loaded to your MLC, **reset** the controller to its factory defaults. (See "Resetting" on page 5-47.)

Displaying the Help program



For information on program features, do one of the following to display the MLC 52 Help screens:

- From the Help menu on the MLC 52 Configuration program screen, select **Contents**.
- Press the F1 computer key.
- From your computer desktop Start menu, select:

  All Programs\Extron Electronics\MLC 52 + DVCM 50\ MLC 52 + DVCM 50 Control Pgm Help

Saving and restoring a configuration

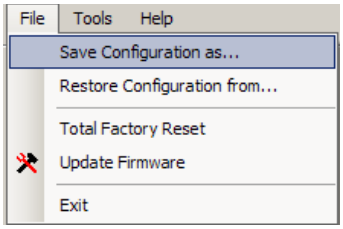
An MLC 52 configuration consists of the display device driver(s); MLC button functions, names, and modes; IR 452 button functions and modes (if applicable); and power and comm port settings for the display device. The configuration displayed when you open the MLC 52 configuration software may have been:

- Created with the Configuration Wizard
- Created via the MLC 52 Windows-based configuration software
- An existing configuration file loaded from your computer

Before adding drivers or programming buttons to create a new configuration, you may want to save your MLC 52's current configuration in case you want to restore those settings in the future.

Saving a configuration

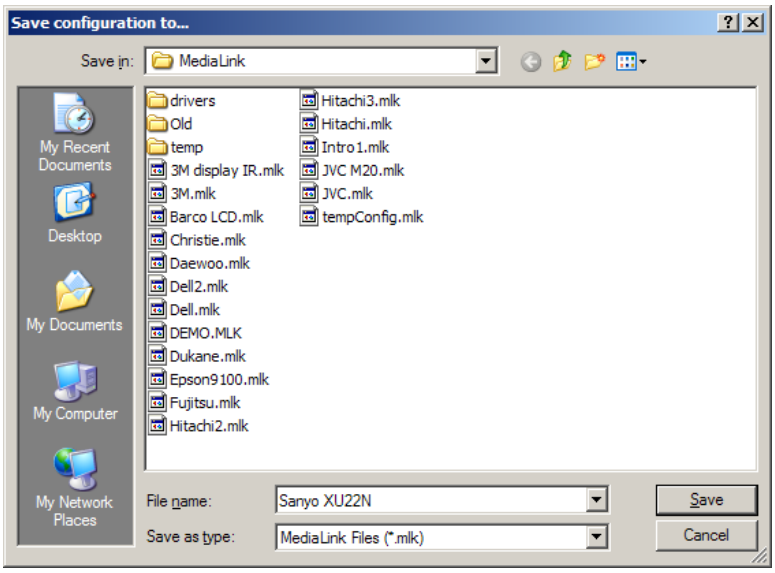
1. From the File menu, select **Save Configuration as...** .



File menu, Save Configuration as... selected

   The "Save configuration to..." window opens.

2. If necessary, browse to locate the folder in which you want to save your configuration. (It is recommended that you save it in the MediaLink folder or in another directory where the file can be found easily.)
3. Make sure the "Save as type" field is set to **MediaLink Configs (*.MLK)**.
4. Type a name for the configuration in the File name field, in the format *filename*.mlk.



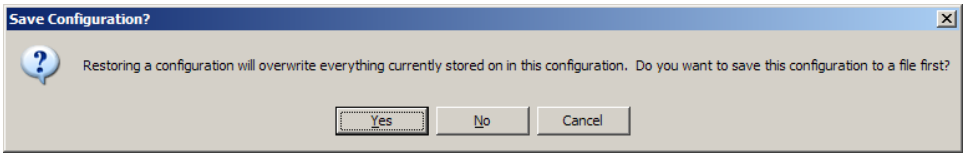
Save configuration to... window.

5. Click **Save**. The current configuration is saved as a file with a **.mlk** extension.

Restoring a configuration

Restoring a configuration allows the software to quickly program an MLC 52 from an existing configuration. To restore a configuration,

1. From the File menu, select **Restore Configuration from...** . The following prompt opens, asking if you want to save the current configuration.

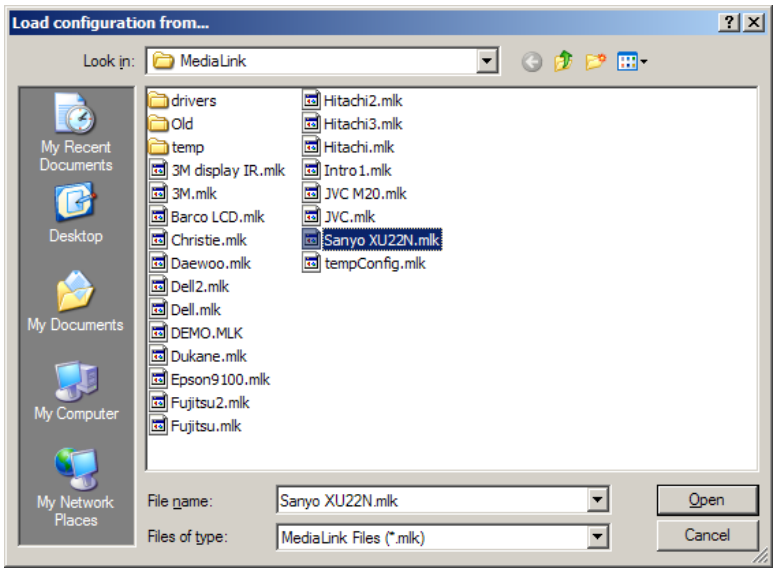

Save Configuration?
Restoring a configuration will overwrite everything currently stored on in this configuration. Do you want to save this configuration to a file first?
Yes
No
Cancel

Save Configuration prompt

2. Click **Yes** if you want to save the current configuration before restoring another one. The "Save configuration to..." window opens. See "Saving a configuration," in the previous section, for the saving procedure.

   Click **No** if you do not want to save the current configuration, or **Cancel** to stop the restoring process.

   The "Load configuration from..." window opens.



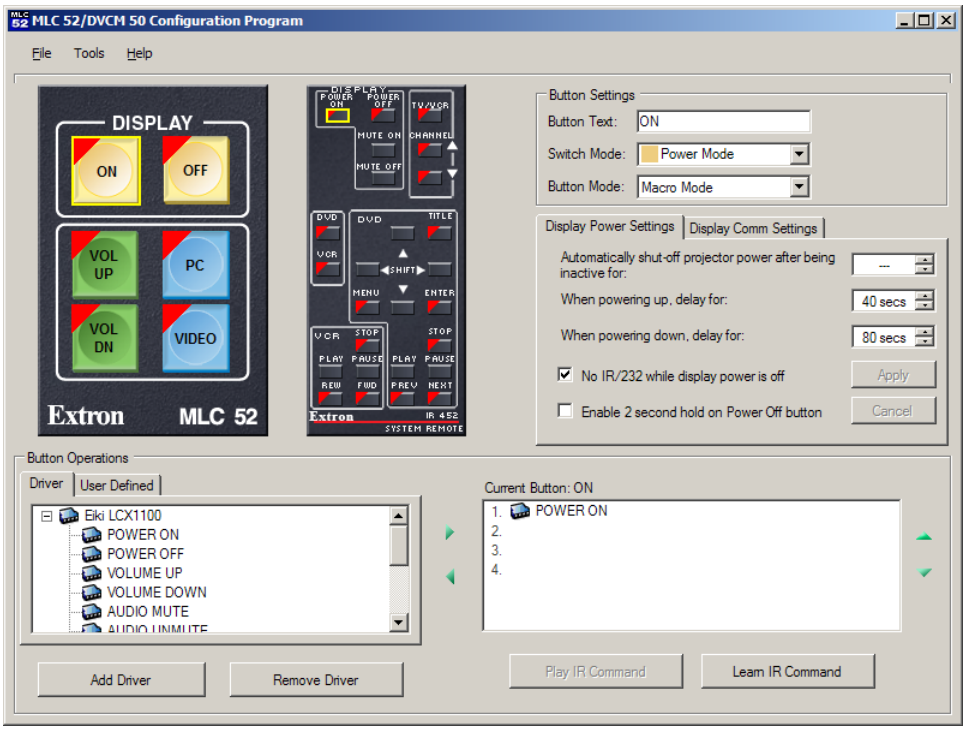
Load configuration from... window

3. If necessary, browse to locate the configuration file that you want to restore. (Configuration files are by default stored in the folder at **c: \Program Files\ Extron\MediaLink**.)
4. Select the desired configuration file. It must have the extension **.mlk**.
5. Click **Open**. After a few seconds, the selected configuration is uploaded to the MLC 52.

Overview of the MLC 52 configuration program main screen

The MLC 52 Configuration Program main screen is the interface from which you configure the controller and IR 452 buttons, and initiate IR learning through software. It lets you perform functions such as picking and assigning IR or RS-232 driver functions to buttons, removing programming from buttons, and selecting a switch mode to group buttons to operate in a mutually exclusive operation. The screen contains graphical representations of the MLC 52 and the IR 452 remote control. Click on a button representation in these diagrams to select a button for programming, then make selections for the button in the other fields on the screen.

NOTE *In the example below, the standard (one-gang sized) MLC is shown. However, the buttons on MLC 52 VC model (with the volume control knob) are configured by the same methods.*



Main screen with a driver added

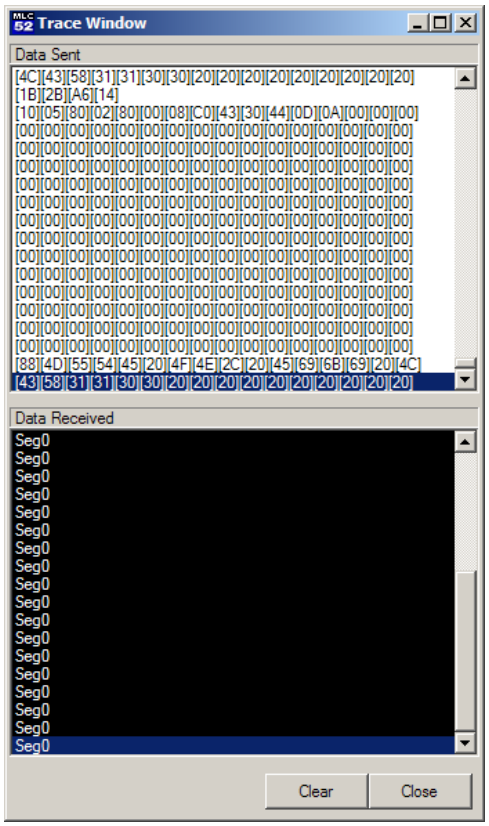
The main screen consists of the following sections:

Menu bar

The menus on the menu bar at the top of the screen enable you to access certain functions and settings for the MLC, as well as the help file.

- **File menu**
  - **Save Configuration as...** — Lets you specify a location and name for the current configuration and save it. (See "Saving a configuration" on page 5-23 for more information.)
  - **Restore Configuration from...** — Lets you locate and load a configuration from your computer to the MLC. (See "Restoring a configuration" on page 5-24.)
  - **Total Factory Reset** — Resets the MLC to its factory defaults. (See "Factory defaults" and "Resetting," later in this chapter, for more information.)
  - **Update Firmware** — Starts the Firmware Loader, which enables you to load new versions of firmware to the MLC. (See "Uploading firmware," later in this chapter, for more information.)
  - **Exit** — Closes the MLC 52 configuration program.
- **Tools menu**
  - **Wizard Options** — Select whether the Configuration Wizard or the MLC 52 main screen will be displayed each time the configuration program is opened. (See "Selecting options for displaying the wizard," later in this chapter, for more information.)

- **Change IR Driver Location** — Lets you select a folder where the MLC will look for the IR drivers that you are loading. (See "Changing the location of the IR Drivers" on page 5-8 for more information.)
- **Show Trace Window** — Opens the Trace Window, in which you can view a record of all commands that are submitted via the front panel, SIS, or the Windows-based configuration software, as well as the MLC's responses to the commands.

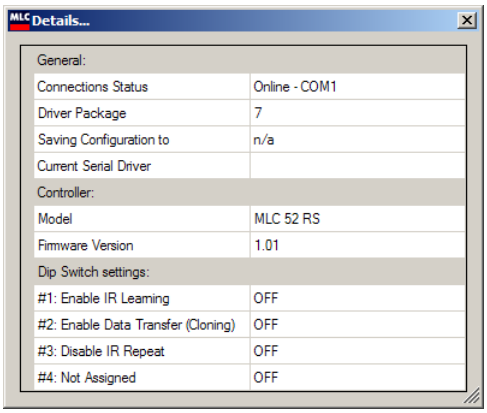


Trace Window example

As you select an option or enter a command, the system's acknowledgement of the input is displayed immediately on the Trace Window. You can scroll through this screen to locate any command that was entered since the last reset or data clearing. You can use this information for troubleshooting purposes.

- **Help menu**
  - **Contents** — Displays the MLC 52 help file, in which you can look up all procedures for configuring the MLC. (You can also display the help by pressing the F1 key on your computer keyboard.)

- **Details...** — Displays the Details window, which gives detailed information on the MLC's current configuration and status.



Details window from the Help menu

When finished viewing the information, click the **X** (Close) button in the upper-right corner to close this window.

- **Check for Updates** — Checks the Extron Web site to find out if the current version of the Windows-based configuration software on your MLC 52 is the latest.

  If a newer version than yours is encountered, the Update Available window is displayed. Click **OK** if you want the MLC software to be updated immediately. Click **Cancel** if you do not want the update at this time.

  If no new versions are encountered, the Update Not Required window opens, informing you that you have the most recent version of the MLC 52 software on your system.

- **About option** — Displays a window giving the current version and part number of the Windows-based configuration software, as well as a representation of your MLC's front panel. Click B to close this window.

About window from Help menu, showing an MLC 52 RS

Front panel representations

The upper-left quadrant of the screen contains representations of the front panels of the connected MLC 52 and of the IR 452 Remote Control. Click the screen buttons in these diagrams to select and program the equivalent buttons on the MLC and/or IR 452.

Button Settings area

In this section of the screen, you can enter text to label the MLC screen buttons on the front panel display (you cannot label the IR 452 buttons). You can also select the switch mode (defining the way the buttons are grouped and function together) for a selected button (Input, Volume, Single Switch) and/or whether the button will execute one command (toggle mode) or multiple commands (macro mode) when pressed. (See "Setting up button modes and labels" on page 5-35.)

Display settings tabs

In this section, the Display Power Settings tab lets you enter information regarding the display device's powering on and off process. The Display Comm Settings tab lets you enter information about the display device's communication port. See "Entering display device power settings" on page 5-38 and "Entering display device communications port settings" on page 5-39.

Button Operations area

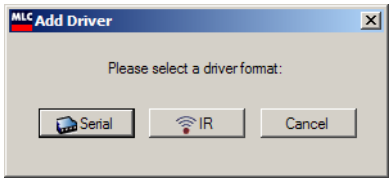
In this section of the screen, you select or define the command(s) to program to a selected button, or remove commands from a button. (See "Assigning functions to buttons" on page 5-32.)

- **Driver tab** — Lists the drivers that have been added to the current MLC configuration. Click on the **+** sign at the left of a driver name to see the commands available for it. (See "Assigning functions to buttons" on page 5-32.)
- **Add Driver and Remove Driver buttons** — Let you add a driver to the current configuration or remove a selected driver from it. These buttons are displayed only when the Driver tab is selected.
- **User Defined tab** — Lets you enter commands for buttons in hexadecimal or ASCII characters. (See "Assigning user-defined functions to buttons" on page 5-34.)
- **Add and Clear buttons** — Add a user-defined command to a selected button, or clear the command coding from the User Defined field. These buttons are displayed only when the **User Defined** tab is selected.
- **Current Button field** — Lists the commands that have been programmed onto the selected button. In this section, you can add or remove any of the listed commands to or from the selected button, using the green right and left arrow buttons. The up and down arrow buttons at the right of the command list enable you to reorder the commands on the list.
- **Play IR Command button** — Executes ("plays") a selected IR driver command that has been programmed on the selected MLC or IR 452 button.
- **Learn IR Command button** — Lets you add a command to a button using IR learning. (See "Assigning functions to buttons" on page 5-32 and "Performing IR learning via software" on page 5-40.)

Adding a driver

To add a serial (RS-232) or IR driver to the MLC,

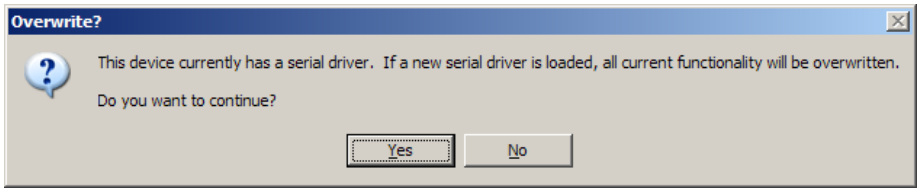
1. Load the serial and/or IR driver package(s) on your computer hard drive, if you have not already done so.
2. Click **Add Driver**, in the lower-left corner of the MLC 52 main screen.
3. On the Add Driver window, click **Serial** or **IR** for the type of driver to be added.



Add Driver window

NOTE *A configuration can contain only one serial driver at a time, although multiple IR drivers are allowed.*

*If you select **Serial** for a configuration that already has a serial driver, the following message appears:*

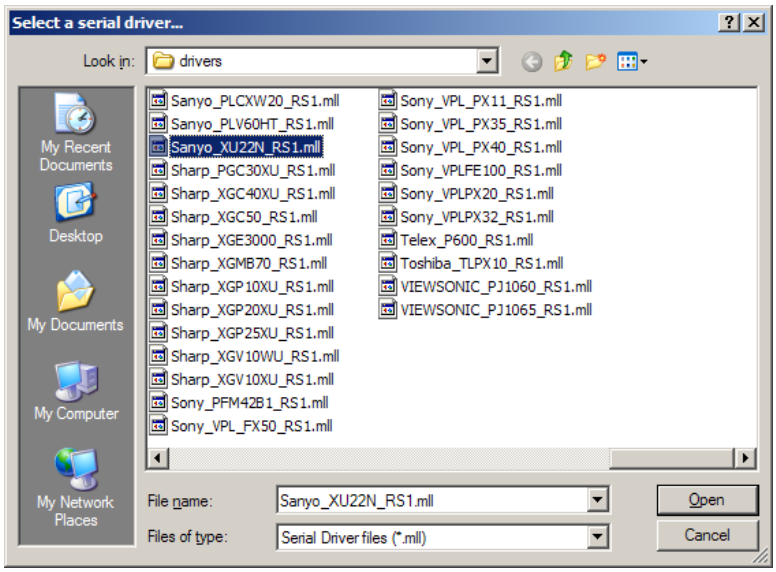

Overwrite?
This device currently has a serial driver. If a new serial driver is loaded, all current functionality will be overwritten.
Do you want to continue?
Yes
No

Serial driver overwrite prompt

   a. *Click **Yes** if you want to continue adding a serial driver, overwriting the existing one. If you want to stop the process, click **No**.*

   b. *If you click **Yes**, another prompt appears, asking if you want to save the current configuration. Click **Yes** if you want to save it; **No**, to continue without saving it; or **Cancel**, to stop loading the driver.*

4. Select the desired driver from the window that opens.
   - **If you select Serial**, the following window opens, displaying the contents of the "drivers" folder, located at **c: \Program Files\Extron\ MediaLink**.

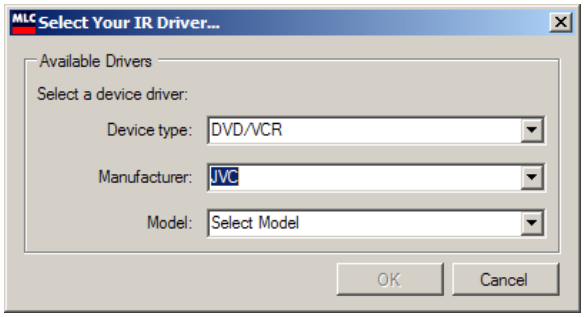


Select a serial driver... window

Double-click on the driver for the desired device. The driver name appears on the Driver tab.

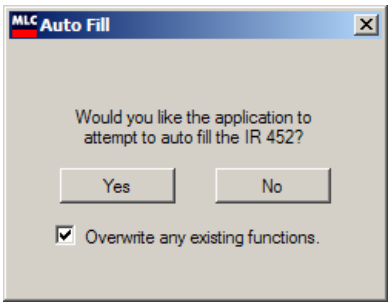
- **If you select IR**, the Select Your IR Driver window opens.

  a. From the drop-down menus, select the device type, manufacturer name, and model name.



Select Your IR Driver window

  b. Click **OK**. If you selected a driver for a DVD, VCR, or DVD/VCR combination, an Auto Fill window opens.



Auto Fill window

c. Click **Yes** if you want the configuration program to fill the IR 452 buttons with the commands available with this driver.

   Click **No** if you want to close the Auto Fill window without auto-filling the IR buttons.

The IR driver name appears on the Driver tab on the MLC 52 main window. If Auto Fill was performed, the IR 452 buttons for which the driver has commands display red triangles in their upper-left corners, indicating that commands have been added to them.

Removing a driver

You remove a driver by different methods, depending on whether the driver is serial or IR.

Removing an IR driver

To remove an IR driver,

1. On the Driver tab, click on the IR driver that you want to remove. The Remove Driver button becomes enabled.
2. Click **Remove Driver**.
3. On the Confirm Delete prompt, click **OK**. The driver name is removed from the Driver tab.

Removing a serial driver

To remove a serial driver, you must either replace it with another serial driver (see "Adding a driver" on page 5-30) or create a new configuration without adding a serial driver to it. You cannot completely remove a serial driver from a configuration after one has been added. (The **Remove Driver** button becomes grayed out and unavailable when a serial driver is selected.)

Assigning functions to buttons

When you add a driver to the configuration, you must add commands to the MLC's buttons to initiate one or more of the driver's functions. You can also add commands to the IR 452 Remote Control buttons. A button can contain up to four commands that are executed when it is pressed.

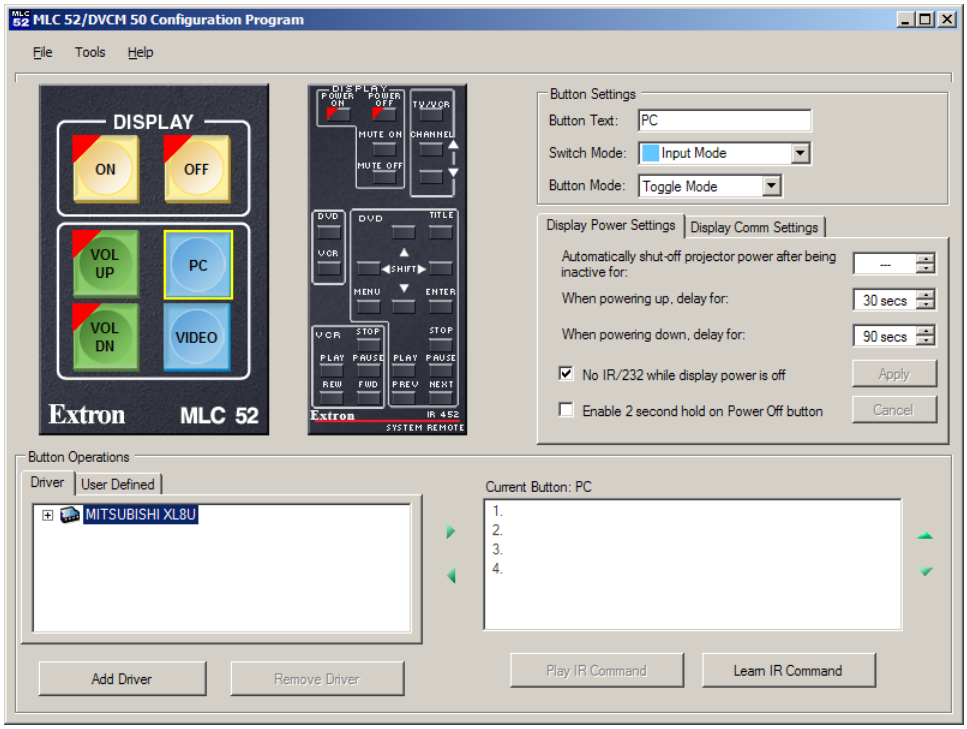
To add a command function to a button,

1. On the front panel representation, click on the MLC or IR 452 screen button to which you want to add a command.

   When you select the button, the following occurs on the screen:

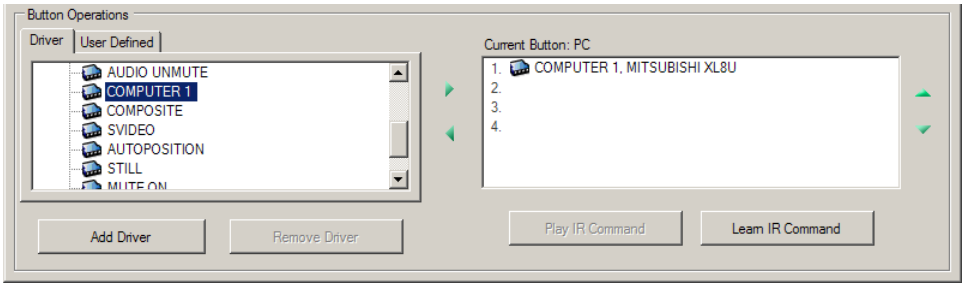
   - A yellow box surrounds the selected button. (In the example below, the MLC's PC button was selected.)
   - The fields in the Button Settings section change to reflect the current settings for the selected button.
   - The button's name appears in the title of the "Current Button" section. (In the example below, the section title reads "Current Button: PC."

NOTE *The Power On and Power Off buttons on the IR 452 are grouped with the On and Off Display buttons on the MLC. If you click on one of these buttons on the IR 452 diagram, its equivalent button on the MLC is also selected, and vice versa.*



PC button selected on MLC 52 main screen

2. On the Driver tab in the Button Operations field, click the + sign in front of the driver name to view the commands available with that driver.
3. On the command list below the driver name, click on the name of the first command that you want to program onto the selected button.
4. Click the green left arrow at the right of the Driver tab. The selected command is displayed beside the number 1 (or the next available command slot) in the Current Button field.



Command added to the first memory block of the PC button

The first time a command is added to a button, a red triangle covers the upper-left corner of the button's screen representation, indicating that the button has been programmed with at least one command.

5. If you want to assign another command to the same button, select the next command you want to add to the button, then repeat step **4**. The command appears beside the next number in the Current Button field.

For each MLC and IR 452 button, you can perform this procedure up to four times, or until the button's four memory blocks are all assigned.

NOTE *For **IR** commands, you can mix driver functions from different devices on the same button. For example, you can program a Mute On button on the remote control with a command to mute a Sanyo projector and another command to mute an NEC projector. You can also add IR commands to a button on which RS-232 commands have been programmed and vice versa.*

Since a configuration can have only one serial driver at a time, you are not able to mix RS-232 commands for different devices on the same button.

Assigning user-defined functions to buttons

This tab provides an alternative way to edit or enter RS-232 codes (not IR). If you want to enter RS-232 commands that are not included the downloadable driver for your display device, or if there is no Extron driver for your device, you can enter codes in this section using hexadecimal or ASCII.

NOTE *You cannot enter IR commands via the User Defined tab; this tab is available for RS-232 only.*

To enter a user-defined command code for an MLC 52 or IR 452 button,

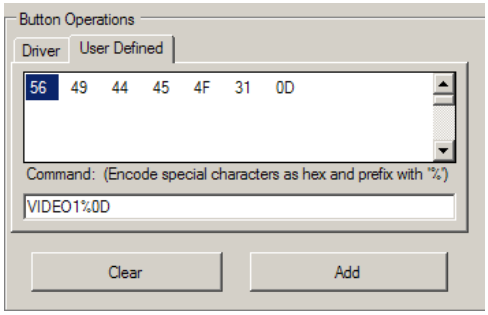
1. Click on the button to which you want to add a command.
2. In the Button Operations area, click on the **User Defined** tab.
3. In the command entry field (the narrow space at the bottom of the User Defined tab), type your command code, using ASCII, hex, or a combination of both character types. The hex codes for your command appear in the larger space above the command entry field.

NOTE *You must enter a **%** sign before each hex character to notify the MLC that the next code will be in hex format.*

Do not enter spaces between characters.

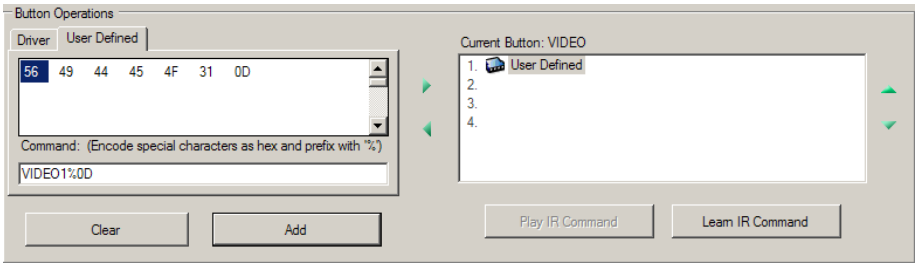
NOTE *An ASCII-to-hex conversion table is on page 5-51 for your reference.*

In the following example, the Video button was selected, and the code VIDEO1%0D was typed in the command entry field. (The 0D command is a hex code for carriage return; it is preceded by %.)



Button Operations section containing a user-defined code

4. Click **Add** to add the command to the selected button. The words "User Defined" appear in the next available command slot in the Current Button field (the actual command and driver names do not appear).



User-defined command entered for Video button

If you do not want to assign the command to the button, click **Clear** to remove your entries from both fields on the **User Defined** tab.

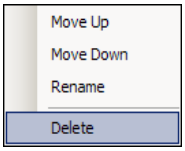
5. Repeat steps **3** and **4** for any additional commands you want to define for the button.

Removing a function from a button

To remove a command from a button,

1. Click on the screen button from which you want to remove a command. A yellow box appears around the button.
2. In the Current Button field, click on the command that you want to remove.
3. Click the green left arrow button at the left of the Current Button field.

Alternatively, you can right-click on the command to be removed and select Delete from the menu that pops up.



The command disappears from the Current Button field.

You can remove only one command at a time from a button. If you want to remove more than one command, you must repeat this procedure for each command to be removed.

Setting up button modes and labels

In the Button Settings field, you can set the following parameters for the MLC buttons.

- **Button Text** — Change the text label that appears on the screen button.
- **Switch Mode** — Select the way buttons are grouped to function together. The button's color on the screen indicates the button's current switch mode.

NOTE *On the actual front panel, the **color** in which the buttons light does not reflect their switch mode; the buttons light only in amber.*

- **Single switch mode** (gray): In this mode, the button operates independently of the other buttons. Pressing a button in this mode does not affect any other button.
- **Input mode** (blue): When you press one of the buttons on the front panel that are in input mode, all other buttons in this mode are inactive. On the MLC front panel, the active button lights brightly; the inactive button(s) are dimmed.

- **Volume mode** (green): This mode is available only on the standard (not VC) MLC model, and only for the two buttons that are (by default) labeled Vol Up and Vol Dn. When an RS-232 driver that contains a volume table is part of the configuration, pressing a button in volume mode accesses the driver's volume table. Each press of the button raises or lowers the volume of the display device by the amount specified in the volume table. When in volume mode, the button labeled Vol Up always increases the volume; Vol Dn always lowers it.

  If you select volume mode for one of these two buttons, the other button is also placed in volume mode.

  If no RS-232 driver has been added, or if the current RS-232 driver contains no volume table, selecting volume mode is the same as selecting single switch mode.

- **Power mode** (yellow): The two Display buttons at the top of the front panel, labeled by default "On" and "Off," are permanently fixed in power mode. When you select one of these buttons, the only setting you can change in the Button Settings section is the Button Text. Power mode is available for only these two Display buttons.

  In power mode, the two buttons are mutually exclusive; if you press one on the front panel, the other one becomes unlit. In addition, if you have entered a number on the Display Power Settings tab to indicate the seconds that the display device delays when powering up and/or down, pressing these buttons causes them to blink for the duration of the specified delay. (See "Entering display device power settings" in the next section.)

• **Button Mode** — When multiple commands are programmed on a button, select the mode in which the commands are performed:

  - **Toggle mode** — When pressed, the button executes only one command. The first time it is pressed, it executes the command that was programmed to its first memory block (the first command listed for that button in the Current Button field). The second time the button is pressed, the command in the second memory block is executed, and so on.

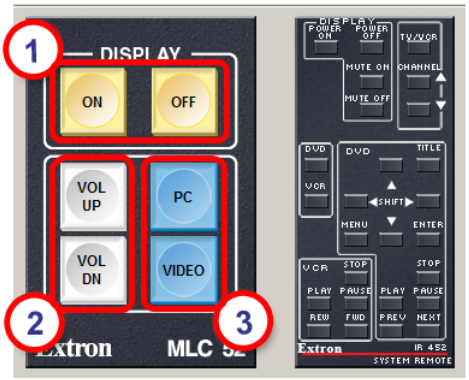
    NOTE *In toggle mode, the commands are always executed in the order that they are programmed in the memory blocks and listed in the Current Button field. For example, if you want to perform the command in memory block 3 of the selected button, you must press the button three times; and the commands in memory blocks 1 and 2 are always performed before command 3.*

    However long the delay between button presses, the commands are always executed in the programmed order, unless another button is pressed in between. If this occurs, the button returns to command 1.

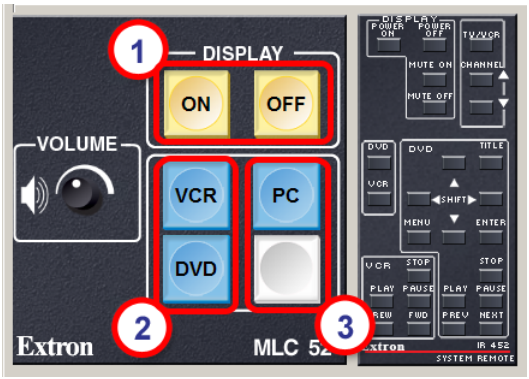
  - **Macro mode** — When pressed, the button executes all the commands programmed to its memory blocks, in the order they are listed in the Current Button field. There is a 2 second delay between command executions.

Factory defaults

When your MLC 52 is delivered from the factory, or after a reset, the buttons are set up as shown in the following figures:



Default button configuration — standard MLC 52



Default button configuration — MLC 52 VC

(1) The two Display buttons on the MLC are set in the power and macro modes, colored yellow, and labeled On and Off. The Power On and Power Off buttons on the IR 452 are also in power mode and tied to the MLC Display buttons. When you click on an MLC Display button, its equivalent Power button on the IR representation is also selected (surrounded by a yellow box).

These are the only buttons that can be in power mode. You can add commands to them and relabel them, but you cannot change their switch mode or their button mode (macro).

(2) The two buttons in the left column (below the Display On button) are configured differently, depending on the MLC model:

- **MLC 52 standard models:** These buttons are designated as volume buttons. They are in single switch mode, colored gray, and are labeled Vol Up and Vol Dn. These are the only buttons that can be placed in volume mode. They can also be in input mode or single switch mode.
- **MLC 52 VC models:** Because the VC models have volume control knobs, volume mode is not available for their buttons. The two buttons in the left column are designated as input buttons. By default they are in input mode, colored blue, and labeled VCR and DVD. They can be placed in single switch mode or input mode only.

NOTE *The Volume knob cannot be configured using the configuration software.*

3. The two buttons in the right column, below the Display Off button, are configured as follows:
   - **MLC 52 standard models:** These buttons are in input mode, colored blue, and are labeled "PC" and "Video."
   - **MLC 52 VC models:** One button is in input mode (blue) and is labeled "PC"; the other button is in single-switch mode (gray) and is unlabeled.

   These buttons can be in either input or single switch mode on all models.

IR 452: The Power On and Power Off buttons on the IR 452 remote control are in power mode and are tied to the MLC Display On and Off buttons. These are the only IR 452 buttons that are programmed with functions and configured in a switch mode. Switch modes are not available for the other IR 452 buttons.

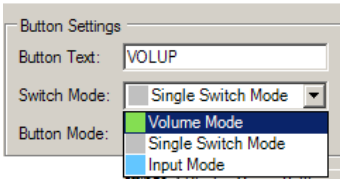
Setting the button modes

To change the button mode or switch mode of a button,

1. Click on the MLC or IR 452 button that you want to set up.

NOTE *For the IR 452 buttons, only the button mode (toggle or macro) can be set.*

2. From the Switch Mode or Button Mode drop-down box, select the mode for the button you selected in step **1**.



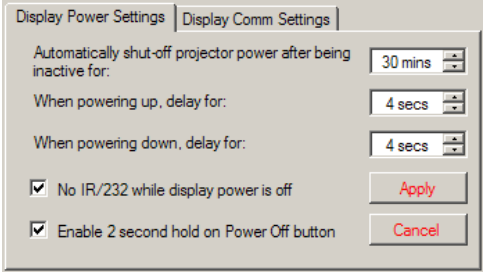
Switch Mode menu for a volume button

The screen button changes color to reflect its new mode.

Entering display device power settings

The Display Power Settings tab lets you make some specifications regarding power settings for your projector or display.

When you make a selection in any of the first three fields, the Apply and Cancel buttons on this tab are enabled and the text on them becomes red. Click **Apply** to implement the change(s) you made, or click **Cancel** if you want to clear settings that have not been applied.



Display Power Settings tab

- **Automatically shut off projector power after being inactive for:**

  Click the up and down arrow buttons at the right of this field to adjust the amount of time the MLC will remain inactive before shutting down the display device. You can select periods in increments of 30 minutes. If this field contains a value, the MLC monitors its button presses; when the specified amount of time passes without a button being pressed, the MLC sends an Off command to the display device. If no amount is entered in this field, the MLC does not turn off the display unless its power Off button is pressed.

- **When powering up, delay for:** and **When powering down, delay for:**

  Click the up and down arrow buttons at the right of these fields to select the number of seconds that elapse between a power button press and the display device powering up or down. When you make a selection in either of these fields, the MLC power button blinks during the period between the button press and the actual power-up or power-down.

  NOTE *These fields do not actually **set** the delay time on the display device; they **reflect** the device manufacturer's settings. The blinking power buttons on the MLC let you know that the device is in the process of powering up or down, and has yet not completed the cycle.*

  Often, the two delay fields are filled in by the device driver when you load it to the MLC (although you can change them). If the driver does not contain this information, you must enter it yourself if you want the buttons to blink during the delay period. If you do not select a number of seconds for either powering on or off, the button does not blink during the delay.

- **No IR/232 while display power is off**

  When this check box is selected, none of the MLC's buttons (except the power On button) issue commands if they are pressed when display device power is off, or when the device is warming up or cooling down.

- **Enable 2 second hold on Power Off button**

  If this check box is selected, you must press and hold the MLC's Off button for 2 seconds in order to power off the display device. After the 2 second period, the Off button starts to blink and the projector begins to shut down. (This helps prevent accidental powering off of the projector.)

Entering display device communications port settings

The Display Comm Settings tab shows the parameters for the display device's communications port. These fields are usually filled with information obtained from the driver when it is loaded. However, if there is no Extron driver for your display device, you must enter this information for your projector or display manually (your device user's manual should provide these settings). If the information you enter here is not correct for your device, the MLC cannot communicate with it.

To enter the display device's communications port settings,

1. Select the correct device settings from the Baud Rate, Data Bits, and Parity drop-down menus. When you make a selection in any of these fields, the Apply and Cancel buttons become active (red).
2. Click **Apply**.

   (Click **Cancel** if you want to clear settings that have not been applied.)

Programming the MLC 52 for control by the IR 452 Remote

The optional IR 452 Remote Control can issue commands to a projector, DVD, VCR, or other device via the MLC 52, which can be programmed to pass on commands received from the IR 452 via the optional IR Link or IRL 20. After programming the MLC to recognize commands sent from the IR 452, you can control a projector or other display device by pressing the IR 452's buttons while pointing it at the IR Link or IRL 20.

You can add up to four functions to each IR 452 button, including commands from different device drivers. This enables you to program one button to transmit a different command signal to up to four different devices, if desired. For example, you could program an IR 452 button in macro mode with four commands so that one press of the Power On button turns on your projector, DVD player, plasma display, and document camera all at once.

With the MLC 52 and IR Link or IRL 20 set up to receive command signals from the IR 452 with its multiple commands per button capability, you can eliminate the various remote controls for your DVD, VCR, projector, etc., and control all your devices using the IR 452.

The MLC 52 main screen contains a representation of the IR 452. You can store remote control button commands on the MLC by adding IR and/or RS-232 driver functions to these virtual buttons. The procedure for programming IR 452 button commands is the same as for the MLC 52 buttons. See "Assigning functions to buttons" on page 5-32 for this procedure.

NOTE *In order to use the IR 452 remote with the MLC 52, you must install the IR Link or IRL 20 and connect it to the MLC. (See "Wiring for IR remote control," in chapter 2, "Installation.")*

NOTE *You cannot configure the MLC 52 from the IR 452 Remote Control.*

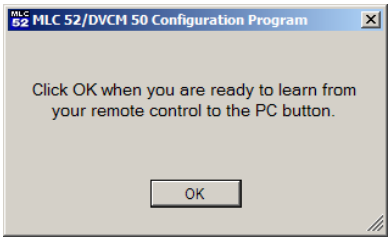
Performing IR learning via software

The MLC 52 can "learn" commands from your display device's remote control in order to control the projector, display, or devices such as VCRs or DVD players. Using IR learning, you can program command codes to a button's four memory blocks. You can also use IR learning to program the IR 452 button functions on the MLC. The MLC cannot be mounted in the wall or furniture while you are doing this.

Follow these steps to initiate IR learning via the Windows-based configuration program:

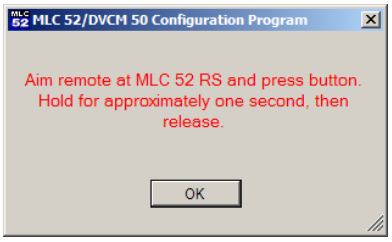
1. Use an Extron Tweeker or other small screwdriver to set configuration DIP switch #1 on the MLC rear panel to the On (up) position.

2. Open the MLC 52 configuration software.
3. Click on the MLC or IR 452 button to which you want to program the command.
4. Click **Learn IR to Button**. The following prompt appears, showing the MLC or IR 452 button you selected and telling you to click **OK** when you are ready to start the IR learning process.



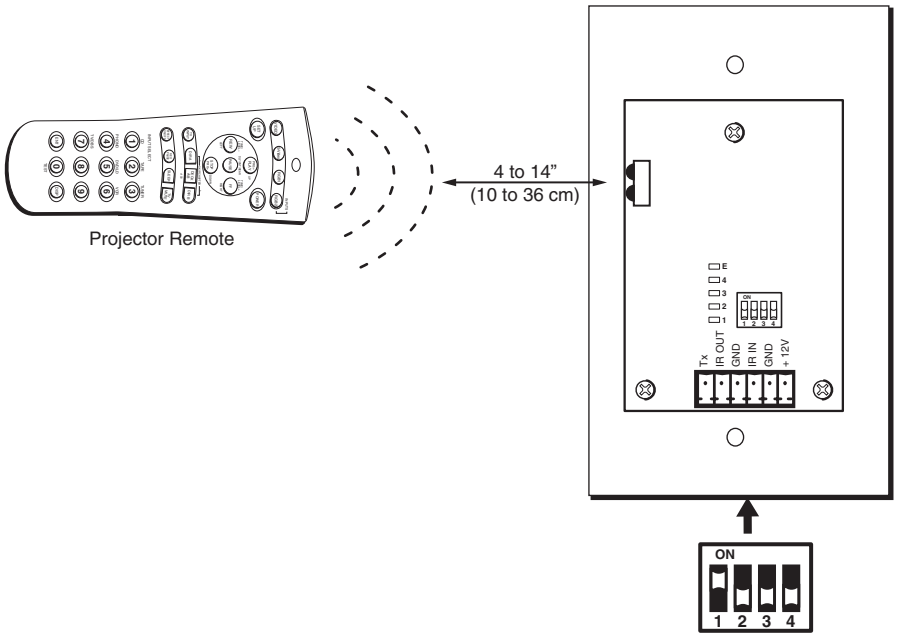
IR learning readiness prompt

5. When you are ready to start, click OK. The text in the prompt window becomes red and changes to the following message:


MLC 52/DVCM 50 Configuration Program
Aim remote at MLC 52 RS and press button. Hold for approximately one second, then release.
OK

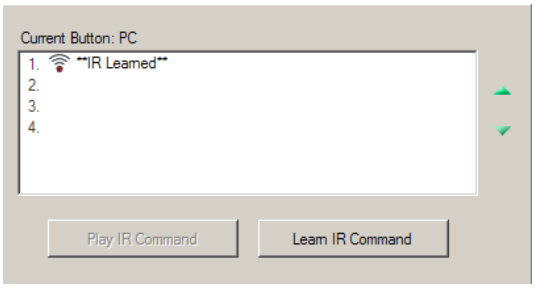
Prompt to press IR remote control button

6. Hold the device's remote control 4" to 14" (10 cm to 36 cm) away from and directly facing the MLC's IR learning LEDs. (You may need to experiment to determine the best IR learning distance for each remote control.) **Within 5 seconds**, press the button on the remote for the command you want to add to the selected MLC button. Hold the remote button for approximately **1 second** (the time may vary, depending on the device remote control).



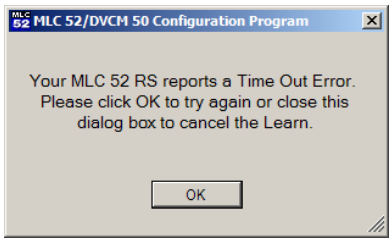
Aiming a projector remote control at the MLC IR learning LEDs

If the command is learned successfully, the Current Button field displays "IR Learned" in the selected button's first available command slot.



Current Button field showing that an IR command was learned to the PC button

If you do not press the device remote control button within 5 seconds, the following dialog box appears, telling you that the IR learning process has timed out.


MLC 52/DVCM 50 Configuration Program
Your MLC 52 RS reports a Time Out Error.
Please click OK to try again or close this dialog box to cancel the Learn.
OK

IR learning timeout prompt

If you want to try to learn the command again, click OK on the prompt, and press the remote control button within 5 seconds. If you want to quit, click the X (Close) button in the upper-right corner of the prompt window.

7. Repeat steps **2** through **6** for each button to be set up with IR codes.
8. Place configuration DIP switch #1 back in the Off (down) position when you are ready to resume normal MLC operation. (All four switches should be down.)

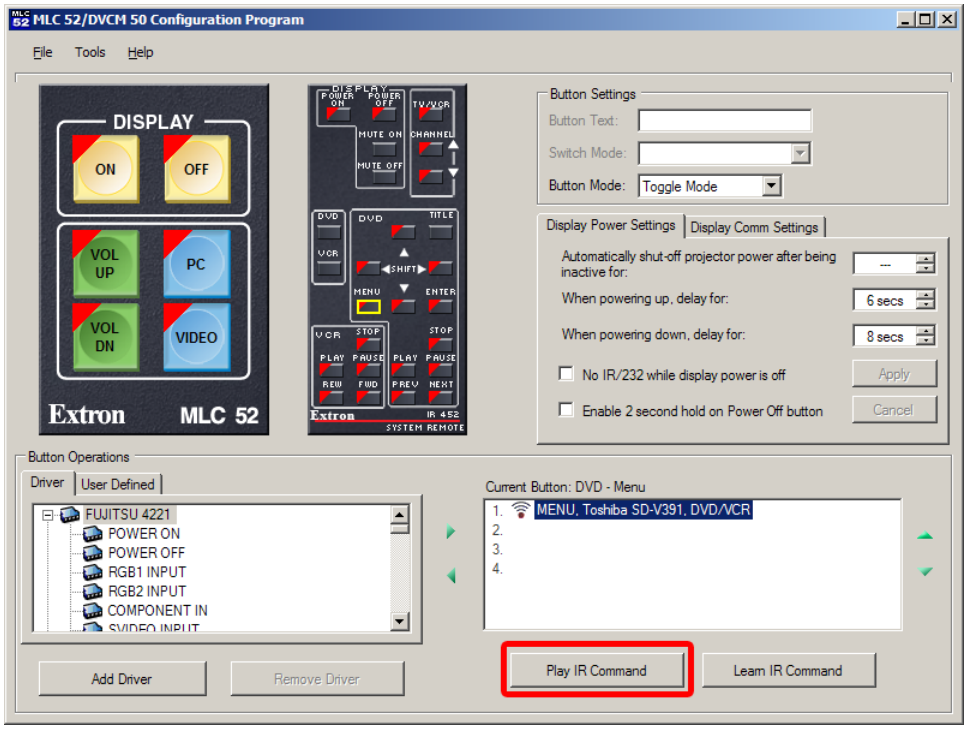
Playing an IR command

Playing a command means issuing the command from the MLC using the configuration software. The result is the same as if the equivalent button were pressed on the display device's remote control.

To play an IR command,

1. On the main screen, click the MLC or IR 452 button whose command(s) you want to play.
2. In the Current Button field, click on the desired command to highlight it.
3. Click the **Play IR Command** button below the Current Button field. The MLC issues the command, and the device performs the function.

   If the button is in macro mode and has multiple commands programmed to it, all of the commands are issued in the order in which they are listed in the Current Button field.



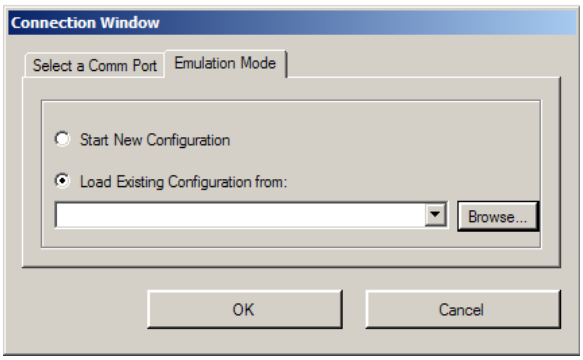
Playing an IR command

Using emulation mode

The MLC 52 configuration program features an emulation mode, which enables you to set up an MLC 52 system before the actual equipment is available on site. You can save the emulated settings as a configuration file on your computer, then load that configuration file to the MLC 52 when the unit is available.

To configure an MLC in emulation mode,

1. Start the MLC 52 configuration program.
2. On the Connection window, select the **Emulation Mode** tab.



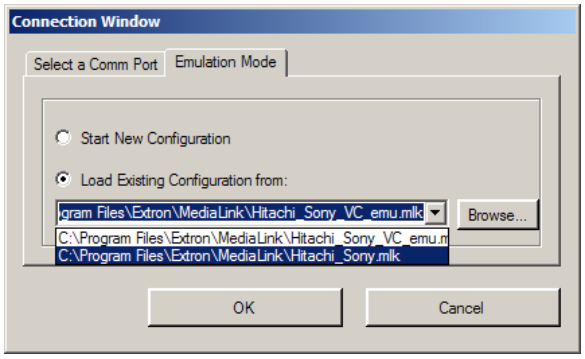
Connection window with Emulation Mode tab selected

3. You can create a new configuration starting from the default settings, or you can base the configuration on an existing setup.

   - **If you are creating a new configuration**, select the Start New Configuration radio button, then click **OK**.
   - **If you want to base your configuration on an existing one,**

     a. Select the "Load Existing Configuration from" radio button.

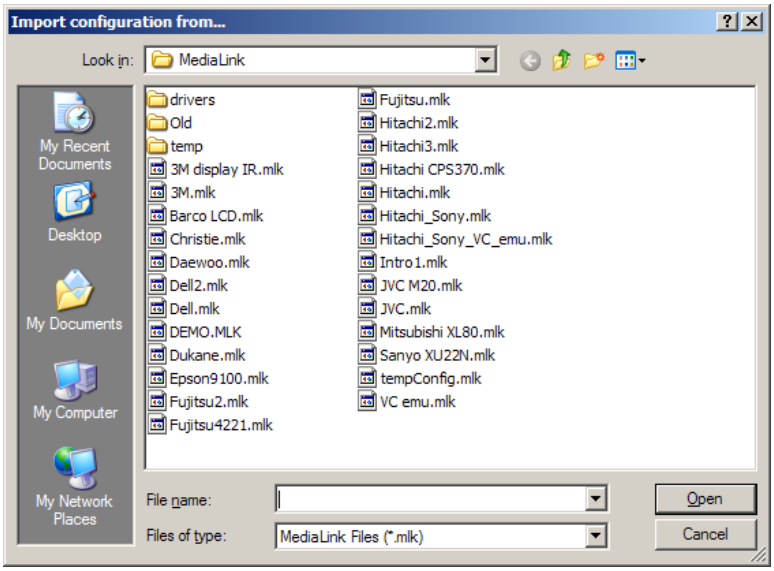
     If you have accessed existing configuration(s) previously, their names appear in the dropdown menu.



Existing configurations dropdown menu on Connection Window

     b. Do one of the following:

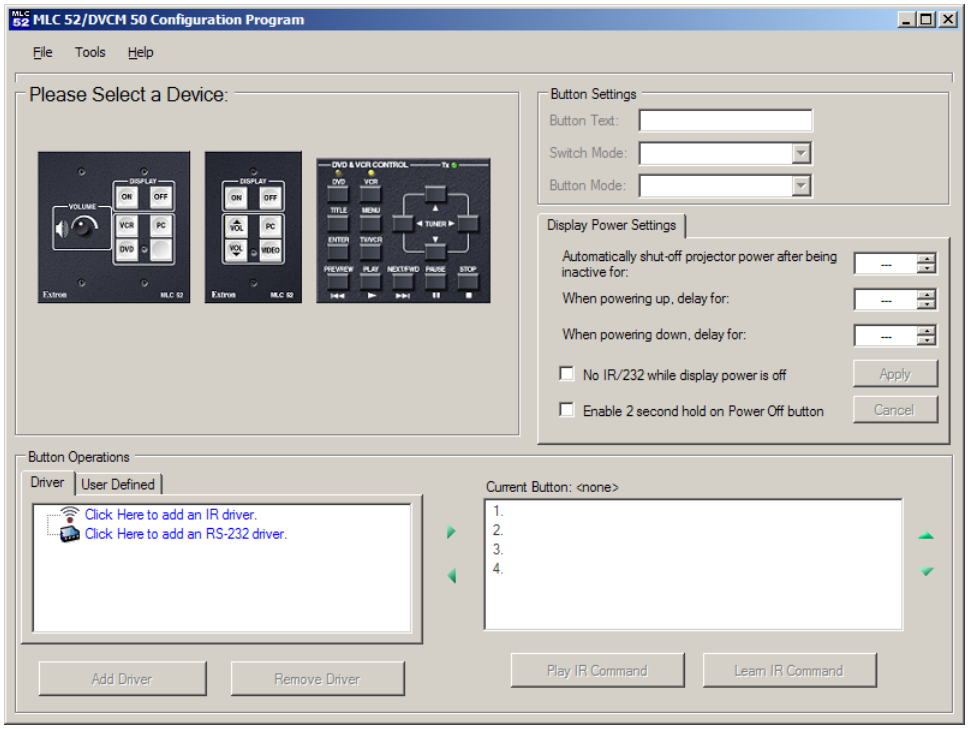
     - Select a file name and path from the drop-down menu.
     - Type in the path to the desired configuration file.
     - Click **Browse** and locate the desired configuration file on your computer. The "Import configuration from" window opens, displaying the configuration (**.mlk** extension) files that are in the MediaLink folder on your computer.



Import Configuration From... window, showing MediaLink folder

c. Double-click on the configuration file that you want to use in emulation mode. Its name appears on the Emulation Mode tab.

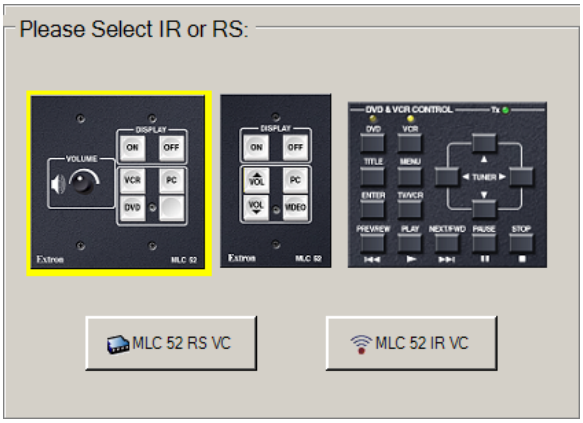
4. Click **OK**. If you are starting a new configuration, the following screen appears:



Device selection screen for emulation mode

5. In the Please Select a Device area, click on the controller for which you want to create the configuration: DVCM 50, MLC 52 VC, or MLC 52. (For DVCM 50 instructions, see the *DVCM 50 User's Manual*.)

6. When you select one of the MLC models, a pair of buttons appears in the Please Select a Device section. Depending on the device you selected in step **5**, the buttons are named MLC 52 RS and MLC 52 IR , or MLC 52 RS VC and MLC 52 IR VC.



MLC driver type selection buttons on the device selection screen

Click the button for the MLC type that you want to configure in emulation mode: **MLC 52 RS** or **MLC 52 RS VC** (loads a serial driver) or **MLC 52 IR** or **MLC 52 IR VC** (loads an IR driver).

7. Select your desired settings on the main screen to configure the buttons as described the following sections: "Assigning functions to buttons," "Setting up buttons," "Entering display device power settings," and "Entering display device communications port settings," earlier in this chapter.

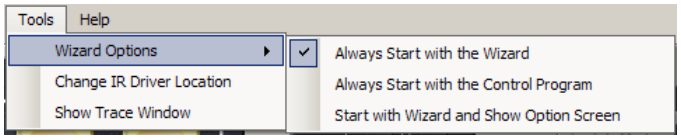
NOTE *You cannot perform IR learning or play an IR command in emulation mode. You must have an MLC connected to your computer for these functions.*

8. Save the configuration as a .mlk file. (See "Saving and restoring the configuration," earlier in this chapter.)

Selecting the starting screen

To select whether the Configuration Wizard or the Windows-based configuration program is displayed when you open the MLC 52 configuration software, follow these steps:

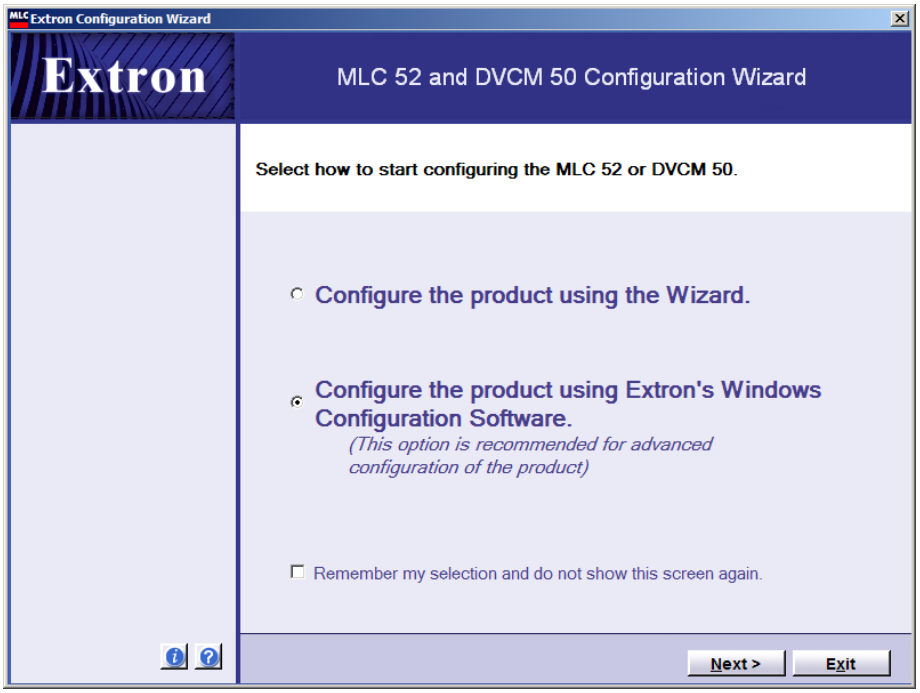
1. From the Tools menu, select **Wizard Options**. The Wizard Options submenu opens.



Wizard Options submenu

2. From the submenu, select one of the following options for displaying the Configuration Wizard at program startup:

   - **Always Start with the Wizard** — When you select this option, the wizard Welcome screen is displayed every time you open the MLC 52 configuration program.
   - **Always Start with the Control Program** — When you select this option, the Connection window is displayed in front of the MLC 52 main screen every time you open the configuration program. The wizard is not opened.
   - **Start with Wizard and Show Option Screen** — When you select this option, an initial configuration options screen is displayed every time you start the configuration program. This screen lets you choose the wizard or the configuration program to configure the MLC for the current session only.


Extron Configuration Wizard
Extron
MLC 52 and DVCM 50 Configuration Wizard
Select how to start configuring the MLC 52 or DVCM 50.
Configure the product using the Wizard.
Configure the product using Extron's Windows Configuration Software.
(This option is recommended for advanced configuration of the product)
Remember my selection and do not show this screen again.
Next >
Exit

Initial configuration options screen

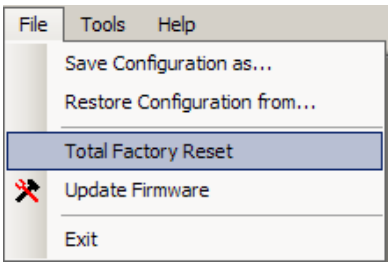
Resetting

Using the configuration software, you can reset the MLC 52 to its factory defaults — the original values and settings with which the MLC was delivered. (See "Factory defaults" on page 5-37.)

NOTE *The Total Factory Reset option is not available in emulation mode.*

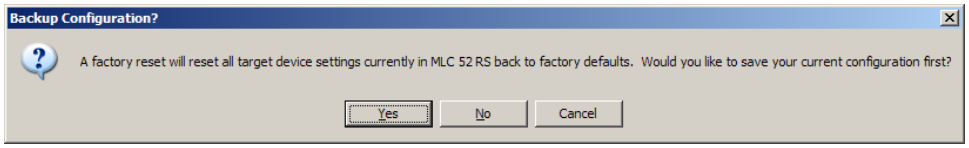
To reset to factory defaults,

1. From the File menu, select **Total Factory Reset**.



File menu, Total Factory Reset selected

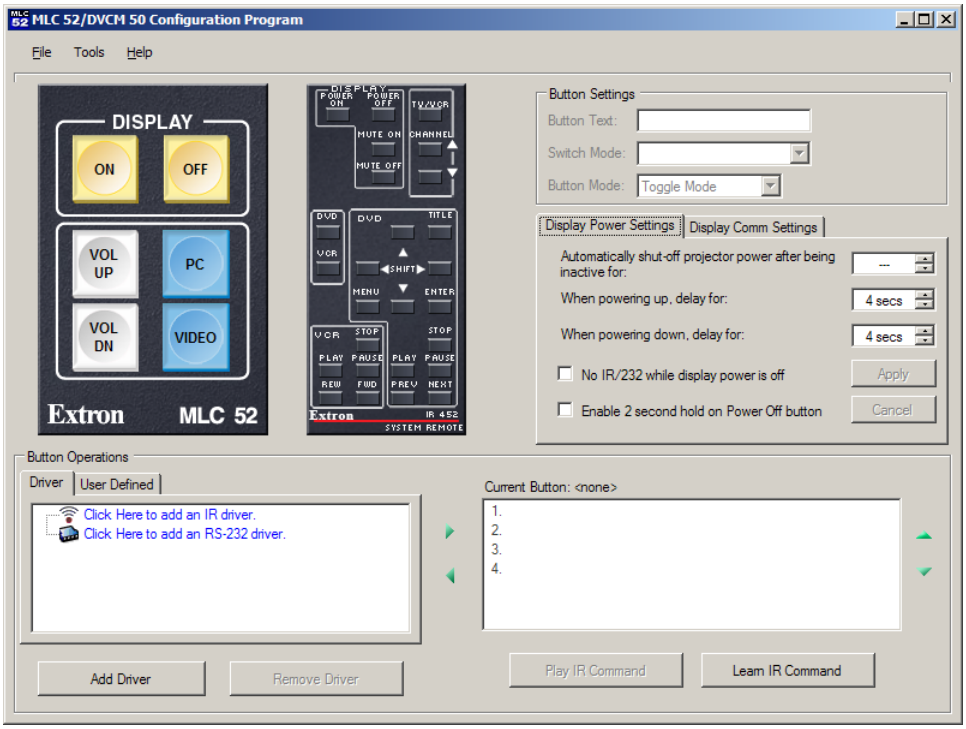
2. The following confirmation prompt appears, asking if you want to save your current configuration before uploading the firmware.


Backup Configuration?
A factory reset will reset all target device settings currently in MLC 52 RS back to factory defaults. Would you like to save your current configuration first?
Yes
No
Cancel

Reset to factory defaults confirmation prompt

- Click **Yes** if you want to save the current configuration. A "Save configuration to" window opens, in which you can specify the intended location and the name of the configuration you are saving.
- Click **No** if you do not want to save the current configuration.

The MLC is reset to its factory default values. After a few seconds, the following screen is displayed:



MLC 52 main screen after reset (standard model)

Uploading firmware

If the need arises, you can update the MLC 52's firmware via the RS-232 connection. Visit the Extron Web site (www.extron.com), and check for firmware updates, which you can download as follows:

Downloading the firmware from the Web

To obtain the firmware file to load to your MLC,

1. Visit the Extron Web site (www.extron.com).
2. Click the **Download** tab.
3. On the Download Center page, click the **Firmware** link at the top of the left sidebar menu.
4. On the Archives line at the top of the Firmware page, click the letter **M**.
5. On the next page that appears, click the **Download** link at the right end of the MLC 52 line.
6. Fill in the required information on the next Download Center page, and click the **Download MLC52** button.
7. Click **Save** on the File Download window.

8. On the Save As window that opens, browse to the folder on your computer where you want to save your firmware file, and click **Save**. The firmware installation file is placed on your computer disk.

Installing the Firmware Loader

Before you can update your MLC 52 firmware, you must have the Firmware Loader program installed on your computer. To obtain the Firmware Loader,

1. Load the Extron Software Products Disk A (delivered with your MLC) onto your computer.
2. On the opening screen, click the **Software** button.
3. On the Control Software screen, click the **Install** link located at the right end of the Firmware Loader line.
4. On the File Download window, click **Run** to begin the installation process. (Click **Save** if you want to download the installer program to your computer, to be installed later.)
5. Follow the instructions on the subsequent windows to install the Firmware Loader.

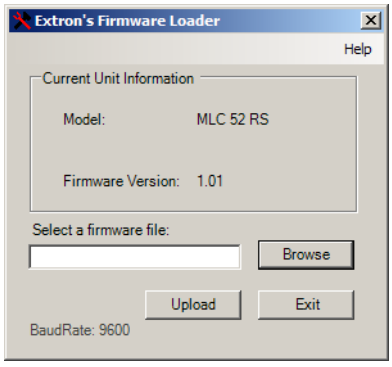
You can also obtain the Firmware Loader from the Extron Web site. On the www.extron.com opening screen, click **Software** on the sidebar menu, then follow steps **3** through **5**, above.

Updating the firmware

After you have downloaded the new firmware file to your computer, follow these steps to upload it to your MLC.

1. Launch the MLC 52 configuration software and save the current configuration. (See "Saving and restoring a configuration" on page 5-23.)
2. From the File menu, select **Update Firmware...** . The Extron's Firmware Loader window opens.

NOTE *The Update Firmware option is grayed out and disabled if the Firmware Loader has not been installed on your computer.*

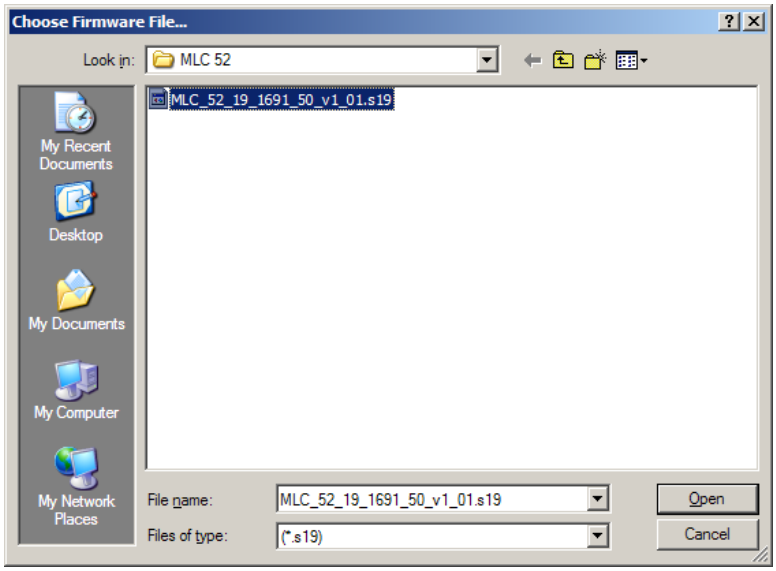


Extron's Firmware Loader window

3. Click **Browse**. A Choose Firmware File window opens.

4. Locate and select the new firmware file. Firmware files are extracted to the following location: **c:\Program Files\Extron\Firmware\MLC 52** ***MLC_52_19_1691_50_vx_xx*.s19**, where **vx_xx** is the firmware version number.

NOTE *Firmware update files have a* ***.s19*** *extension; make sure that the "Files of type" field is set to *.s19.*

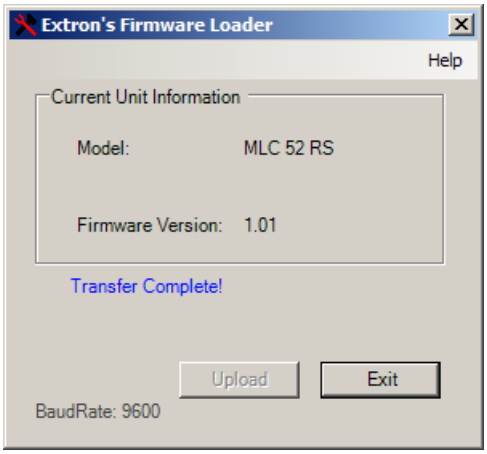


Selecting the firmware on the Choose Firmware File window

5. Click **Open**. The path to the firmware file is displayed in the Select a Firmware File field on the Firmware Loader window.

6. On the Firmware Loader window, click **Upload**. The firmware update file is uploaded to your MLC. During the process, the Firmware Loader window indicates the progress of the upload.

   When the upload is complete, the message "Transfer Complete!" appears in blue on the Firmware Loader window.



Firmware Loader window

7. Click Exit to close the window. When you reopen the configuration program, the new firmware version is in effect.

Using Simple Instruction Set (SIS™) Commands

Simple Instruction set (SIS) commands can be entered on your PC to find out more information about the MLC 52.

Host-to-MLC communications

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the MLC determines that a command is valid, it executes the command and sends a response to the host device. All responses from the controller to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

MLC-initiated messages

When a local event such as a front panel (or Extron switcher front panel) selection or adjustment takes place, the MLC responds by sending a message to the host. No response is required from the host. The MLC-initiated messages are listed here (underlined).

(C) Copyright 2005, Extron Electronics MLC 52, Vx.xx ↵

The MLC sends the copyright message when it first powers on.

Error responses

When the MLC receives a valid SIS command, it executes the command and sends a response to the host device. If the MLC is unable to execute the command because the command is invalid or it contains invalid parameters, it returns an error response to the host.

The error response codes and their descriptions are as follows:

E10 – Invalid command
E14 – Invalid for this configuration

Using the command/response tables

The command/response tables below and on the following pages list valid command ASCII codes, the MLC's responses to the host, and a description of the command's function or the results of executing the command. Upper and lower case characters may be used interchangeably in the command field.

The ASCII to HEX conversion table below is for use with the command/response tables.

ASCII to HEX Conversion Table														Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27				
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F				
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37				
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F				
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47				
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F				
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57				
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F				
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67				
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F				
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77				
x	78	y	79	z	7A	{	7B	l	7C	}	7D	~	7E	DEL	7F				

ASCII to Hex conversion table

Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A).

← = CR (carriage return only) (hex 0D).

• = Space.

[Esc] = Escape key.

[X1] = Firmware version number (X.XX format)

[X2] = Display power status (0 through 3).
- 0 = display power is off.
- 1 = display power is on.
- 2 = display is cooling down.
- 3 = display is warming up.

[X3] = On/off status.
- 0 = off/disabled.
- 1 = on/enabled.

[??] = Memory block number in hexadecimal, where [??] can be 0 to 7F (hex) (0 to 127 decimal).

NOTE *Commands are **not** case-sensitive unless otherwise indicated.*

Command/response table for SIS commands

Command	ASCII Command (host to MLC)	Hexadecimal (host to MLC)	Unit response (MLC to host)	Additional description
Firmware version, part number, and information requests				
Query firmware version number	Q	51	X1 ↵	Show the controller firmware version X1 (X.XX).
View part number	N	4E	60-744-02↵, 60-744-12↵, 60-745-02↵, or 60-745-12↵	Show the MLC 52's part #.
View model name	I	49	MLC 52 IR↵, MLC 52 RS↵, MLC 52 IR VC↵, or MLC 52 RS VC↵	Show the MLC model name.
Display (projector) power on/off				
Turn display power on	1P	31 50	Pwr 1↵	
Turn display power off	0P	30 50	Pwr 0 ↵	
View display power status	P	50	Pwr X2 ↵	X2 = display power status: 1 = on 0 = off 2 = display cooling down 3 = display warming up
Example:	P	50	Pwr2↵	The projector/display is cooling down.
Reset				
Reset switches to factory default	Esc zXXX←	1B 7A 58 58 58 0D	ZapX↵	Reset all switches and buttons to the factory default and erase any codes added by the user.
Front panel lockout (executive mode)				
Unlock	0X	30 58	Exe0↵	Unlock front panel.
Lock	1X	31 58	Exe1↵	Lock front panel.
View front panel lock	X	58	X3↵	Display status X3 of front panel lock. 0 = unlocked 1 = locked
Upload firmware				
Upload firmware {number of data bytes}	Esc Upload←		go... Upl	Upload a new or different version of firmware. **Upl** is displayed after the upload is complete.

Command/response table for advanced instructions (for the MLC 52 configuration program)

Data downloads and uploads are initiated by sending a series of hexadecimal commands to the configuration port of the MLC. The Windows-based configuration program uses these commands mainly to load and save driver data and system configuration settings.

Command	Hexadecimal (host to MLC)	Response (MLC to host)	Additional description
Send/receive data to/from page 0 memory			
Send	1B 2B A0 [16k bytes of data]	Dnl0 ↵	The host downloads 16k bytes of binary data to page 0 of the MLC's memory.
Receive	1B A1 0D		The MLC sends 16k bytes of binary data to the host.
Send/receive data to/from page 1 memory			
Send	1B 2B A2 [16k bytes of data]	Dnl1 ↵	The host downloads 16k bytes of binary data to page 1 of the MLC's memory.
Receive	1B A3 0D	[16k bytes of data]	The MLC sends 16k bytes of binary data to the host.
Send/receive a segment (256 bytes) of data (a segment relating to a single button)			
Send	1B 2B A6 ?? [256 bytes of data]	Seg0 ↵	The host sends 256 bytes of binary data to the MLC.
Receive	1B A7 ?? 0D	[256 bytes of data]	The MLC sends 256 bytes of binary data to the host.
Initiate or abort IR learning			
Start learning	1B B0 ?? 0D	LrnRdy ↵	Initiate IR learning.
		LrnTimOut ↵	Timeout during IR learning.
		LrnRetry ↵	Retry IR learning. (Aim remote control at MLC, press button again.)
		LrnFail ↵	IR learning has failed.
		LrnOK ↵	IR learning has succeeded.
Abort learning	1B B1 0D	Lrn Abort ↵	Abort IR learning.
Activate a memory block (segment)/emulate a button press			
Activate a block	1B D0 ?? 0D	IRSnd*?? ↵	Activate/trigger a memory block. (Send the command stored at that address).

NOTE *?? indicates the block number in hex notation where ?? can be 0 to 7F (hex) (0 to 127 decimal).*

NOTE *The responses shown are ASCII.*

Appendix A

Specifications, Part Numbers, and Accessories

Specifications

Part Numbers and Accessories

Specifications, Part Numbers, and Accessories

Specifications

Control/remote — MLC controller host ports

Serial control port	1 front panel 2.5 mm mini stereo jack (tip-ring-sleeve)
Baud rate and protocol	9600 baud, 8 data bits, 1 stop bit, no parity
Serial control pin configurations	Mini stereo jack: tip = TX, ring = RX, sleeve = GND
Program control	Extron's configuration program for Windows® Extron's Simple Instruction Set (SIS™)

Control — projector/plasma (MLC 52 RS, MLC 52 RS VC)

Projector control port	(1) 3.5 mm direct insertion captive screw connector, 6 pole for IR and 1-way RS-232 control (connector is shared between power input and IR and 1-way RS-232 projector control)
IR control	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz
RS-232 control (1-way)	±5 V
Baud rate and protocol (RS-232)	57600 to 1200 (9600 default) baud (configurable); 8 (default) or 7 data bits; 1 stop bit (±5 V); no parity (default), or even or odd parity
IR learning frequencies	30 kHz to 62 kHz
IR learning distance	4" (10 cm) to 14" (36 cm) from the side panel

Control — projector/plasma (MLC 52 IR, MLC 52 IR VC)

Projector control port	(1) 3.5 mm direct insertion captive screw connector, 6 pole for IR (connector is shared with power input)
IR control	TTL level (0 to 5 V) modulated infrared control from 30 kHz up to 60 kHz
IR learning frequencies	30 kHz to 62 kHz
IR learning distance	4" (10 cm) to 14" (36 cm) from the side panel

Control — peripheral equipment (MLC 52 RS VC, MLC 52 IR VC)

Control port (for 10k ohms control)	(1) 3.5 mm direct insertion captive screw connector, 3 pole
Pin configuration	1 = reference voltage input, 2 = variable voltage output, 3 = GND

General

External power supply	100 VAC to 240 VAC, 50/60 Hz, external, autoswitchable; to 12 VDC, 1 A, regulated
Power input requirements	12 VDC, 0.15 A
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Rack mount	Yes, with optional faceplate #70-554-02 or 70-554-03. Also wall- and furniture-mountable.
Enclosure type	High-impact plastic
Enclosure dimensions	
MLC 52 RS, MLC 52 IR	
Faceplate	4.5" H x 2.78" W x 0.13" D (11.4 cm H x 7.1 cm W x 0.3 cm D) (1 gang)
Device	2.5" H x 1.6" W x 1.5" D (6.4 cm H x 4.1 cm W x 3.8 cm D) (Depth excludes connectors and buttons.)
MLC 52 RS VC, MLC 52 IR VC	
Faceplate	4.5" H x 4.6" W x 0.13" D (11.4 cm H x 11.7 cm W x 0.3 cm D) (2 gang)
Device	1.4" H x 1.3" W x 0.9" D (3.5 cm H x 3.3 cm W x 2.3 cm D) and 2.5" H x 1.6" W x 1.5" D (6.4 cm H x 4.1 cm W x 3.8 cm D) (Depth excludes knob, connectors, and buttons. Allow at least 2" (5 cm) depth in the wall or furniture for device and cable clearance.)

Product weight
MLC 52 RS, MLC 52 IR ... 0.2 lb (0.1 kg)
MLC 52 RS VC, MLC 52 IR VC
0.3 lb (0.1 kg)
Shipping weight ..... 3 lbs (2 kg)
Vibration ..... ISTA 1A in carton (International Safe Transit Association)
Listings ..... UL, CUL
Compliances ..... CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF ..... 30,000 hours
Warranty ..... 3 years parts and labor

NOTE *All nominal levels are at ±10%*

NOTE *Specifications are subject to change without notice.*

Part Numbers and Accessories

Included parts

These items are included in each order for an MLC 52 controller:

Included parts	Part number
MLC 52 IR	60-744-02
MLC 52 RS	60-744-12
MLC 52 IR VC	60-745-02
MLC 52 RS VC	60-745-12
Button labels — icon and text	33-1262-01
International label	33-1167-02, 03
IR Emitter and shield kit	70-283-01
12 VDC, 1 A power supply	70-055-01
MLC 52 Configuration Program software for Windows (on CD ROM)	
ESD grounding card and cable kit	
6-pin, 3.5 mm captive screw connector	
Tweeker (small screwdriver)	
MR100 1-gang plastic mounting brackets (mud rings) (1 black, 1 white)	70-519-12, 13
MR200 2-gang plastic mounting brackets (mud rings)(1 black, 1 white)	70-519-22, 23
MLC 52 MediaLink Controller User's Manual (on CD ROM)	
MLC 52 MediaLink Controller Quick Start Guide	

Optional accessories

These items can be ordered separately:

Mounting hardware	Part number
One-gang EWB external wall box (black, white)	60-452-02, -03
One-gang junction box, 2.5" deep	980130
One-gang SMB surface mount box (black only)	60-639-02
Two-gang EWB external wall box (black, white)	60-453-02, -03
Two-gang junction box, 2.5" deep	980084
Two-gang junction box, 3.5" deep	980057
Two-gang SMB surface mount box (black only)	60-640-02

Faceplates	Part number
MLM 1GWP (black, white)	70-528-02, -03
MLM 52 VC, plastic (black, white)	70-527-02, -03
MLM 52 VC, metal (black, white)	70-538-02, -03

Miscellaneous accessories	Part number
MPA 122 Mini Power Amplifier	60-668-01
MPA 181T Mini Power Amplifier	60-747-01
IR Link IR signal repeater (black, white)	60-404-02, -03
IRL 20	60-580-01
VC 50 Volume Control Wall Plate	70-530-02
IR 452 Remote Control	70-543-01
Configuration cable	70-335-01

Cables

This cable is recommended for connecting an MLC to an IR Link.

CTL and CTLP (Comm-link) cable	Part number
50'/15 m, plenum	26-461-01
100'/30 m, plenum	26-461-02
200'/60 m, plenum	26-461-03
300'/90 m, plenum	26-461-05
400'/120 m, plenum	26-461-04
Bulk 500'/150 m, non-plenum	22-148-02
Bulk 1000'/300 m, non-plenum	22-148-03
Bulk 500'/150 m, plenum	22-119-02
Bulk 1000'/300 m, plenum	22-119-03

Appendix B

Templates

MLC 52 IR and MLC 52 RS Template

MLC 52 IR VC and MLC 52 RS VC Template

Templates

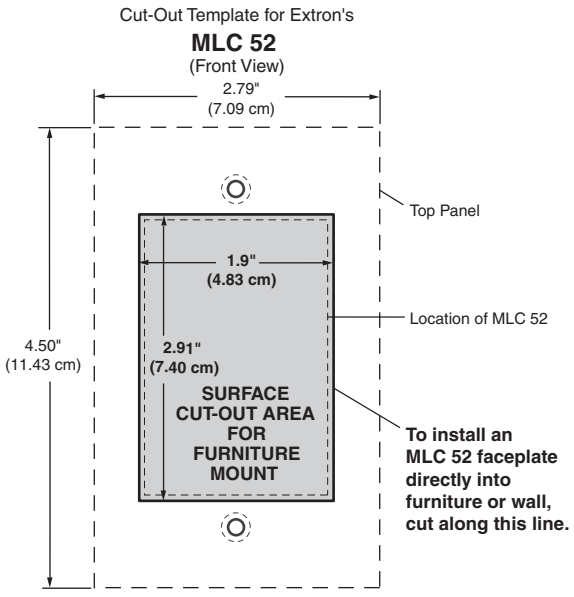
Use the rough-in templates in this appendix as guides to measure and mark the hole in the wall or furniture through which the MLC 52 will be mounted. The templates provide measurements for installing the controller with either an electrical box or a mounting bracket. (You do not need the templates if you are mounting the panel using an external mounting option.)

NOTE *The templates are not to scale and are provided for reference only.*

The MLC controller requires a depth of at least 1.25" (3.2 cm) inside the wall or furniture.

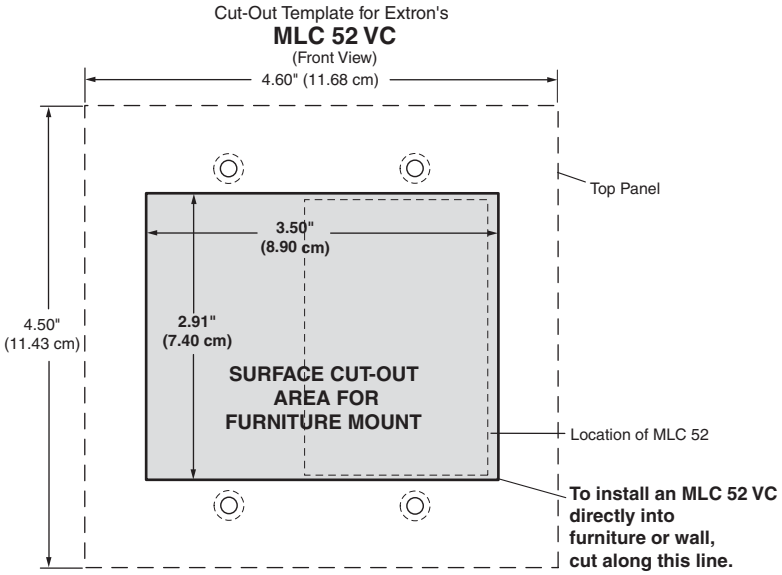
NOTE *If you use a wall box or mud ring, connect it to an earth ground. If you do not use a grounded wall box or mud ring, ground the faceplate to an earth ground, or tie it to the circuit ground via a ground pin on the circuit board.*

MLC 52 IR and MLC 52 RS Template



MLC 52 IR and MLC 52 RS cutout template

MLC 52 IR VC and MLC 52 RS VC Template



MLC 52 IR VC and MLC 52 RS VC cutout template

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Kyodo Building,
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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